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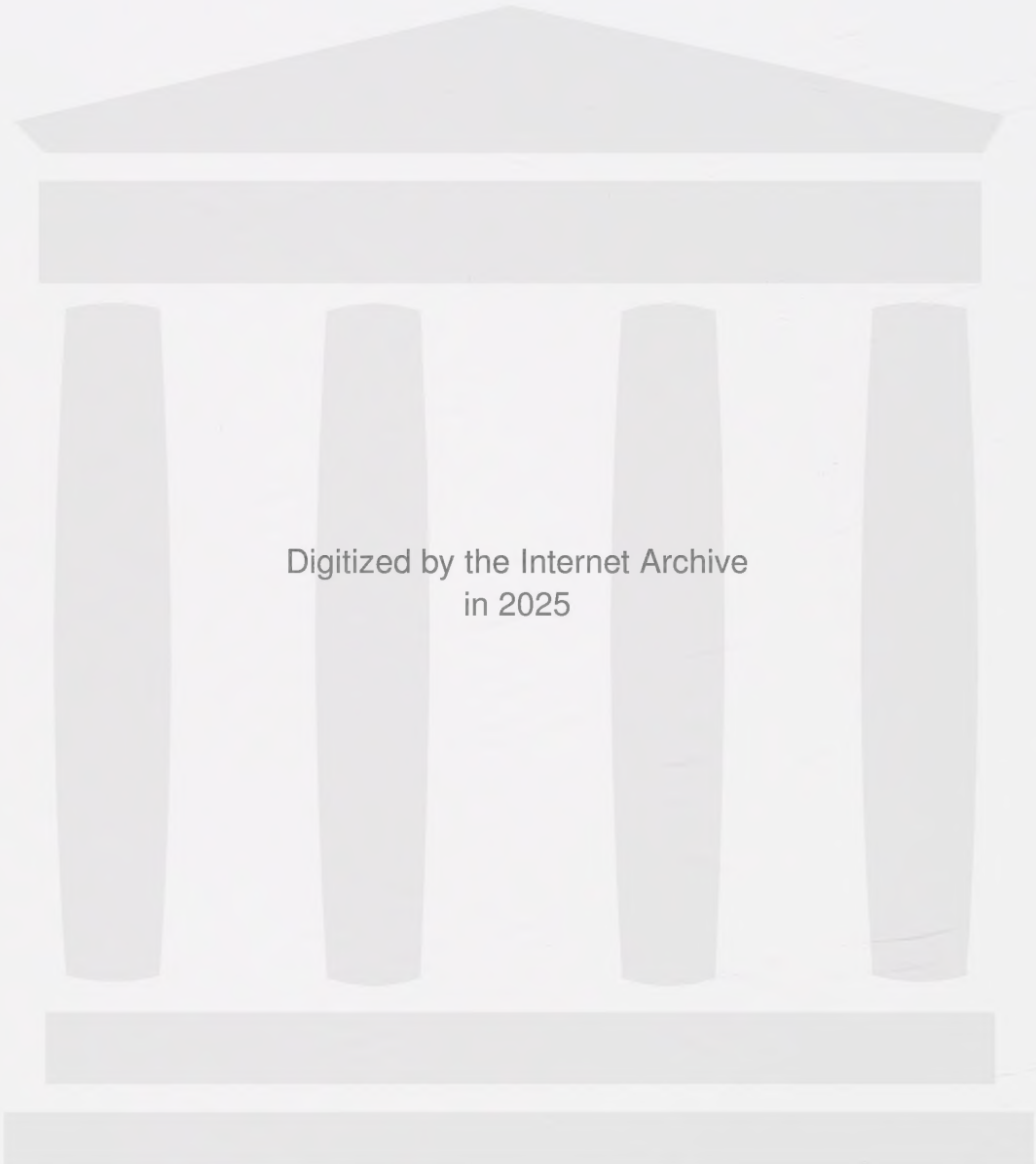
Report of the National Marine Fisheries Service for the calendar year 1979



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United States Department
of Commerce

National Oceanic and
Atmospheric Administration

National Marine
Fisheries Service

Report of the National Marine Fisheries Service for the calendar year 1979

THE SECRETARY OF COMMERCE
Washington, D.C. 20230

President of the Senate
Speaker of the House

Dear Sirs:

It is my honor to submit to you the National Marine Fisheries Service Report for Calendar Year 1979 as required by Section 9(a) of the Fish and Wildlife Act of 1956 (16 U.S.C. 742h(a)), before being amended by the Congressional Reports Elimination Act of 1980 (P.L. 96-470).

The report describes the Service's programs, activities, significant accomplishments, mission, and organization, as well as the status of the U.S. Fisheries. The report reflects the progress made in achieving the goals of research, utilization, and management of our marine fisheries resources in the national interest.

Sincerely,

Secretary of Commerce

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Introduction

The National Oceanic and Atmospheric Administration (NOAA) was created in 1970 to reflect our concern as a nation about the oceans and the atmosphere of this earth. We are concerned with the oceans as a source of food, energy, recreation, and knowledge. A better understanding of the complex interrelationship between global atmospheric and oceanic processes is essential to the continuing well-being of all people. In the 10 years since inception, NOAA evolved into an organization to establish national policies, and to manage and conserve our oceanic, coastal, and atmospheric resources. NOAA provides managerial, research, and technical expertise for practical services and for scientific information about those resources.

Within NOAA, the National Marine Fisheries Service (NMFS) manages and conserves the fishery resources within the fishery conservation zone (FCZ) (from the seaward boundaries of the coastal states out to 200 nautical miles from the U.S. coast). NMFS aids in the protection of vital habitats of marine species, and in the conservation of whales and other marine mammals. NMFS assists in the economic development of the U.S. fishing industry, and conducts research designed to support all of these programs.

This report summarizes the programs, activities, and accomplishments of NMFS during calendar year 1979. Primarily it reports on management and administrative aspects of the NMFS programs. It is not intended to cover the specific scientific or technical accomplishments of NMFS. The detailed results of the scientific research groups (Fisheries Centers) are published in journals and technical reports for dissemination to the research community and to the public through the National Technical Information Service.

Mission, organization and administration

The first "Fisheries Service" (U.S. Fish Commission) was established in 1871. Since that time, the Service has seen many organizational changes. In many instances, the NMFS programs, specific goals, and directions have also changed and expanded because of new legislation, increased activities, and changing national priorities. However, the basic mission continues to be the conservation and protection of living marine resources.

NOAA manages, conserves, and protects the living resources of the sea through its NMFS. Between 15 and 18 percent of the world's traditionally harvested fishery resources are found within 200 miles of America's coasts. NOAA administers the Fishery Conservation and Management Act of 1976 (FCMA) - a unique law designed to assure that fishing stays within sound biological, economic, and other limitations and that U.S. commercial and recreational fishermen have the opportunity to utilize all of the fishery resources within these limits.

The NMFS performs basic biological and technical research through a nationwide network of 24 of the world's finest fishery laboratories. By implementing the Marine Mammal Protection Act of 1972, the Endangered Species Act of 1973, the Fish and Wildlife Coordination Act, and a variety of other laws, NMFS also seeks to protect vital living marine resource habitats and unique species of marine fish and wildlife, such as the great whales, porpoises, seals, and sea turtles.

Goals

To accomplish its mission, NMFS has major programs including: optimum utilization and development of fisheries, conservation and effective management of living marine resources, and preservation and protection of living marine habitats.
These programs seek to accomplish specific goals such as:

- conservation and management of marine fisheries resources as required by FCMA;

- management of domestic interjurisdictional fisheries (including anadromous);

- development and strengthening of international management for fisheries resources of interest to the United States;

- restoration and enhancement of fish habitats, where this is possible and practical

- recognition and development of alternatives for resolving the conflicting uses of fish habitats;

- development of new fisheries and use of non-traditional species;

- financial assistance to the private sector of the fisheries industry;

- provision of statistics, marketing information, research information, and advisory information to industry and to consumers;

- coordination and participation on joint venture negotiations with foreign interests;

- coordination of marine recreational fisheries activities at the national level;

- participation with U.S. Commissioners on international fishery commissions;

- support of bilateral fishery claims boards and provision of NOAA translations of foreign publications;

- continuous monitoring and assessing of the nation's living marine resources;

- development of data management systems and preparation of scientific/technical publications to meet national-level information needs;

- coordination and support of aquaculture research programs;

- collection, processing, retrieval, and distribution of fisheries data, related statistics, and research information;

- administration of the Pribilof Islands as a special reservation.

Organization

As shown in Appendix 1, the NMFS organization is composed of headquarters offices, four regional Fisheries Centers, and five Regional Offices - to conduct an integrated program of resource management, conservation, research, and administrative activities. The regional boundaries and principal field facilities are indicated here.
The Fisheries Centers conduct multidisciplinary research programs, provide scientific and technical information, and provide expertise for the conservation and management of living marine resources in their respective regions. The Regional Offices are the focus for planning, organizing, and implementing fishery management and conservation programs. The Regional Offices serve as the NMFS representative with state conservation agencies, the fishing industry, other constituencies, and the general public; and provide administrative or technical support to the respective Regional Fishery Management Councils.

Administration

Legal counsel

The increased national emphasis on resource management, on conservation and preservation, and on regulation has involved NMFS in more legal activities and litigation. There is also more legislation affecting marine resources. The legal expertise for these activities is provided by the NOAA Office of General Counsel. A summary of significant litigation for 1979 has been provided by that office and is given in Appendix II. The major items of new legislation were:

- Public Law 96-61 of August 15, 1979, which amends the Shipping Act (46 U.S.C. 251(a)) to prohibit foreign-built fishing vessels flying the U.S. flag from fishing within the 200-mile fishery conservation zone. Further, it establishes a procedure designed to support the protection of whales by reductions in fish allocations.

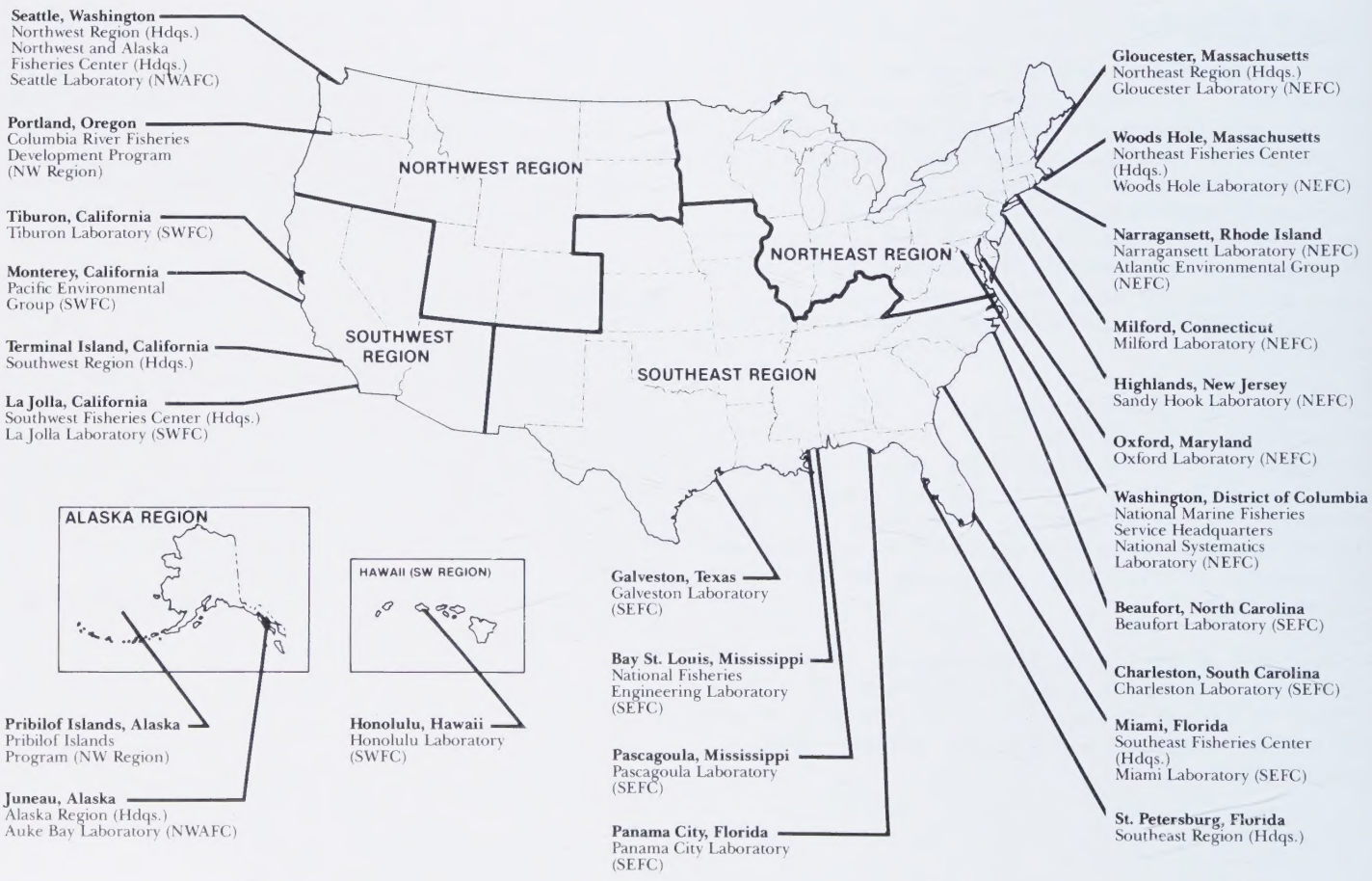
- Public Law 96-118 of November 16, 1979, amends the Anadromous Fish Conservation Act (16 U.S.C. 757a) to extend authorization of the Act, and to authorize studies on declining striped bass populations.

- Public Law 96-159 of December 28, 1979, amends the Endangered Species Act of 1973 (16 U.S.C. 1531-1543) to extend authorization of the Act. It extends certain certificates of exemption for products affected by the Act, upon application by business with preexisting stocks of those products, and it establishes an International Convention Advisory Commission.

Budget

The funding for NMFS activities in fiscal year (FY) 1980 (October 1, 1979 to September 30, 1980), totals $124,095,700. The direct appropriations are $98,226,900 and the Saltonstall-Kennedy (S-K) funds are $25,868,800. This total budget shows an increase of $19,994,100 in funding as compared to FY 1979, of which $12,500,000 is S-K Special Project funding. The allocations, by program subactivity, are shown in the table attached as Appendix III.

NMFS principal facilities



Year in review

Fishery management

NOAA places great emphasis on the need for effective fisheries management efforts. Not every fishery resource needs to be regulated; however, where management is necessary, NMFS must insure that the resources for which the Secretary of Commerce is responsible are conserved and (if needed) enhanced.

This was the third year in which the U.S. fisheries were managed under the Fishery Conservation and Management Act of 1976. Management has continued to produce a significant reduction in the foreign catch of fish within 200 miles of our coasts, and an increase in the catch by U.S. vessels.

For example: Foreign catches in the U.S. fishery conservation zone (FCZ) reached a peak of 3.7 million metric tons in 1971. In 1979, the foreign catch of fish (including shellfish and excluding tunas) was 1.6 million metric tons, or 29 percent below the average of the 5 preceding years. The combined catch by U.S. and foreign vessels in the FCZ was increased by 2 percent from 1978, and the rise in the U.S. catch more than offset the decline in the foreign catch. The U.S. share rose to 33 percent of the total (up from 27 percent in 1978). Commercial landings (edible and industrial) by U.S. fishermen at U.S. ports were a record 6.3 billion pounds valued at a record $2.2 billion in 1979, up 4 percent in quantity and 20 percent in value compared with 1978, the previous record year. More detailed statistics are given in Appendix IV: State of the Fisheries, 1979.

Eight Regional Fishery Management Councils prepare plans that indicate how each fishery should be managed, after consideration of all relevant scientific, social, and economic factors. In 1979, NMFS developed an improved procedure for preparation of management plans. Members of Congress and their staffs, leaders of environmental groups, consumer associations, and officials of the fishing industry were consulted and regional workshops were held with the Councils to obtain comments and suggestions on an appropriate procedure. A manual entitled "Operational Guidelines for the Fishery Management Plan Process" was produced and distributed to establish uniform procedures and provide for multiyear plans and other innovative concepts.

Despite these extensive efforts at simplification and standardization, the fishery management plan process is complex and lengthy, with 250-300 working days needed to promulgate regulations for a fishery from the time a Council prepares a draft plan. Therefore, multi-year, flexible plans are encouraged to refine management measures through regulations rather than the lengthy amendment process.

Twenty-five major fisheries are governed by completed management plans. Ten management plans governing fisheries from New England to Alaska were completed by the end of last year and eleven more were in the final stages of approval. Nine new plans are expected to be submitted for approval during 1980.

Enforcement

Through joint enforcement efforts of NOAA and the Coast Guard, a number of foreign vessels were seized in 1979 in Alaskan waters for underreporting catch. These vessels were assessed substantial penalties.

Domestic enforcement efforts in some fisheries were hampered in 1979 by complex regulations which were difficult to enforce. Consequently, fishery management plans are now reviewed more closely to insure that they provide practicable enforcement measures.

Data collection and management

Two major projects began in 1979 to improve fisheries data collection and information management. The first is the development of a 5-year plan for collecting and using important

economic and social data in managing U.S. marine and anadromous fisheries resources. The Regional Fishery Management Councils will participate in the preparation of the plan with the cooperation of interstate fishery commissions, trade associations, environmental and recreational fishery organizations, and the staffs of academia. This plan will be completed during the first part of 1980.

The second project is the coordination of all fisheries data management activity by the National Data Management Committee. This committee recommends policy to NMFS, establishes standards and procedures, and monitors the development of regional and nationwide information systems. The Committee recently commissioned a study to determine the most effective way to communicate fisheries data between NMFS Centers. This study, Project DATALINK, which is expected to be completed in 1980, will be the basis for a comprehensive data communication network.

Marine recreational fishing

This was the first full year of systematic recreational fishery data collection in the States along the Atlantic coast, the Gulf of Mexico, and islands in the Caribbean and Western Pacific. A similar study was initiated along the Pacific coast (i.e., Washington, Oregon, California) in July 1979.

The Western Pacific Fishery Management Council, the Gulf States Marine Fisheries Commission, and the State of Maryland used the NOAA survey as a base for additional data. This assistance assured the reliability of the data. California, Connecticut, Guam, Mississippi, New Hampshire, Oregon, South Carolina, and Washington provided field samplers to assist in data collection efforts. Data from these surveys will be used by the Regional Fishery Management Councils for management purposes, as well as by NOAA, the states, the recreational fishing industry, and the public. The results will be integrated with a total data collection system.

Last year, a study was completed to identify social and economic data needs for marine recreational fisheries and to develop methods for obtaining these data. This study will be used to initiate a survey in 1981 to collect social and economic information on recreational fishing.

State/Federal fisheries management

The State/Federal Fisheries Management Program began in 1971 to assist the states in developing and implementing fishery management plans for interjurisdictional stocks in state waters. In fact, the State/Federal Program was the forerunner of the FCMA, although its focus has been within territorial waters. Now the FCMA provides the primary mechanism for developing fishery management plans, but full implementation of those plans still depends upon voluntary cooperation by the coastal states in regulating fishing activities in their waters in a manner compatible with Federal regulations. Due to this clear dependency and because of other responsibilities imposed upon the states by the Coastal Zone Management Act, the Marine Mammal Protection Act, and the Endangered Species Act, etc., a NOAA task force devoted considerable effort during 1979 to identifying ways in which the State/Federal Program could assist and enhance mutually beneficial State/Federal programs, activities, and relationships.

This assessment, and the recommendations it produced, convinced NOAA that there is a need to improve State/Federal activities related to living marine, estuarine, anadromous, and commercial Great Lakes fisheries. The states have documented their needs, assigned priorities for attention, and indicated a willingness to participate and to share the burden in establishing an effective State/Federal Program.

Anadromous fisheries activities

Several activities that pertain to anadromous species began in 1979. During early fall, the Administration proposed a $90 million salmon and steelhead program for application in the State of Washington to alleviate some of the fishery allocation problems between certain treaty tribes and other fishermen, and to enhance the fishery. In conjunction with the Department of the Interior and the Office of Management and Budget, a draft bill was submitted to Congress. The purpose is to provide stability in the commercial fishing and charter fishing industries and improve the distribution of fishing power between treaty and nontreaty fisheries in the State of Washington through the purchase of commercial vessels, gear, and licenses, and through loans to treaty tribes and fishermen to develop the industry. The bill would also improve opportunities for salmon and steelhead recreational fishing.

NMFS is collaborating with the Department of the Interior on a project designed to restore the runs of Atlantic salmon into New England rivers. Atlantic salmon restoration efforts have been hampered due to lack of returning adults and the subsequent offspring. This project will use techniques developed by the NMFS Northwest and Alaska Fisheries Center. Atlantic salmon will be pen-reared and spawned in Puget Sound, and then the eggs will be shipped back to New England hatcheries for hatching, growth, and liberation. We are optimistic that this 10-year program of 5 million eggs annually will be the key to successful Atlantic salmon restoration in New England.

An additional cooperative project underway with the Department of the Interior is a 3-year emergency study of the causes for decline in populations of striped bass. This study was authorized by an amendment to the Anadromous Fish Conservation Act and authorizes $1.0 million in FY 80, $1.75 million in FY 81, and $2.0 million in FY 82 to be divided equally between the U.S. Fish and Wildlife Service and NMFS. The study will cover economic aspects of the striped bass fisheries, determine the reasons for population declines, and assess the populations in the major areas between Cape Hatteras and Maine.

Fisheries development and trade

In 1978, U.S. commercial landings of fish and shellfish reached a record level of 6.3 billion pounds, up 4 percent from 1978 (the previous record year). These records were due primarily to continued high landings of menhaden in the Atlantic and Gulf. Sharply higher landings of salmon in 1979 were offset by lower landings of tuna.

Exports in 1979 of edible U.S. seafoods were $189 million more than in 1978, but imports were $41.5 million more than in the previous year. The resulting deficit between exports and imports rose to $1.6 billion in 1979, up almost 15 percent compared with 1978.

The Administration is committed to reducing this deficit by promoting fisheries development. The Department of Commerce sponsored a National Conference on Fisheries Development in May 1979, at which a national fisheries policy was announced. The program called for the active partnership of the fishing industry, state, and local governments to join with the Federal Government in U.S. fisheries expansion.

Over the past year NMFS has coordinated with other components of the Department of Commerce, including the Bureau of Export Development, the Economic Development Administration (particularly its regional offices), and the Secretarial Representatives in a number of the key cities where fisheries development activities are taking place, to further our fisheries development initiatives. NMFS is reviewing how Sea Grant Universities can participate most effectively in the research and technology, and in the demonstrated needs identified by the Fisheries Development Initiative. NMFS will discuss the results of this review with the Sea Grant Directors to ensure active participation by the universities.

An Export and Domestic Market Study was contracted and published in May 1979; it has been widely distributed to industry. It analyzed markets for U.S. underutilized fish and shellfish in 16 different countries, and has proved valuable to individuals and firms in the export business, particularly those exporting nontraditional species.

An important aspect of NMFS fisheries development policy is the linkage of foreign access to the U.S. FCZ with efforts to expand U.S. export trade into foreign markets. Nations receiving allocations to harvest fish off the coast of the United States receive a clear benefit. Access to their domestic markets is a reasonable return benefit to the United States.

The trade mission to Japan in October 1978, led by former Secretary of Commerce Kreps, was followed by a Seafood Sales Mission to Japan in June 1979. Japanese imports of nontraditional U.S. seafood species did not increase in 1979, but renewed discussions are being undertaken to base allocations on trade. Another export mission to Japan is planned, as well as a later trade mission to Spain.

With private contractors, NMFS is developing a computer listing of all American seafood processors and exporters (by species and product). This program will be expanded to include foreign seafood importers, and processors, as well as large institutional buyers through the Worldwide Information Trade System (jointly operated by the Departments of Commerce and State). A series of foreign-language brochures is being developed to promote American seafoods overseas, and a new contract is planned for more in-depth market studies of foreign seafood markets.

NMFS is participating in a NOAA program for the growth and development of the Pacific Basin. Part of the program planned for a conference in Honolulu relates to the development of fish resources in the Pacific Basin.

The 1978 FCMA amendments on joint venture operations between U.S. fishermen and foreign processors were implemented through interim regulations and published in February 1979. These regulations authorized permits for joint ventures until final regulations could be approved.

In 1979, three applications for joint venture permits were processed under the interim regulations: two for the Soviet Union to process U.S. caught groundfish in the Gulf of Alaska and Pacific hake, and one for the Republic of Korea to process groundfish in the Gulf of Alaska.

Two new fishermen's compensation programs are being implemented. The Fishermen's Contingency Fund provides compensation to U.S. fishermen for damages or losses resulting from oil and gas exploration, development, or production on the Outer Continental Shelf. Final regulations for this program were published on January 24, 1980; 114 claims were filed during 1979. The Fishing Vessel and Gear Damage Compensation Fund provides compensation for vessel or gear damage caused by foreign or domestic vessels or acts of God. Final regulations for this program were published in October 1979, and 53 claims were received in FY 1979. In addition, approximately 500 fishermen lost gear as a result of Hurricane David in FY 1979, and their claims under this program have been received and are being processed.

International accomplishments

In the international arena, U.S. fisheries trade opportunities with other countries have improved, and there is a continuing search for an international means to conserve fishery resources that range beyond our fishery conservation zone.

During 1979, a provisional agreement was reached with Canada that allows continued cooperative management of Pacific halibut through the International Pacific Halibut Commission, under adjusted access arrangements to this transboundary resource. This agreement has received Senate advice and consent to ratification.

Efforts to reach an agreement with Canada on limiting the interceptions by each country's fishermen of Pacific salmon were interrupted by the death of Donald L. McKernan, who had served as the U.S. spokesman in these negotiations since their inception. After an extensive review of Pacific salmon interception questions, talks were resumed with Canada on these issues in late 1979, and are expected to have high priority attention in 1980.

Atlantic salmon was also the subject of preliminary consultations between the United States and other countries regarding possible international conservation arrangements.

International management arrangements for tuna are being maintained in the Atlantic but are uncertain in the Pacific area, where incomplete negotiations have yet to result in a new conservation and management agreement.

Negotiations among the Antarctic Treaty powers to conclude a new convention for the conservation of the marine living resources of Antarctica were well advanced by the end of 1979, with the expectation that an international commission will be created to address ecosystem management measures. Interim conservation measures are underway prior to international ratification of the proposed convention.

Developing effective international arrangements to conserve transboundary resources and to manage the resources that are available to many countries is a complex, and often frustrating task. Yet these agreements are essential to conserve valuable marine resources.

The Presidential decision to withhold all 1980 Soviet fishing allocations in U.S. waters, except for the Gulf of Alaska, will have considerable impact on the Soviet fishing industry. The allocations, which will be withheld indefinitely, constitute almost 6 percent by weight of the global Soviet catch, or 350,000 metric tons of pollock, mackerel, herring, groundfish, hake, and squid, and are valued at $100 million. At the time of the decision, 70,000 metric tons of fish in the Gulf of Alaska had already been allocated to the Soviets and will not be withdrawn.

Possible reallocation of the Soviet quota to other nations is under review, but no decision has been made. The decision will be considered in conjunction with efforts to promote exports of U.S. fisheries products. The fishing sanctions will have no effect on the U.S. fishing industry unless the Soviets decide to cancel some of the U.S.-Soviet joint venture operations.

Marine mammals and endangered species

The 1979 meeting of the International Whaling Commission was perhaps the most successful meeting of that organization from the conservation point of view. It resulted in a moratorium on factory ship operations for all but minke whales, a reduction in the quota on sperm whales, and the establishment of a whale sanctuary in the Indian Ocean. Australia stopped its whaling activities in 1979, and Brazil announced its intent to stop commercial whaling by 1981. Japan announced that it was banning the importation of whale meat and products from countries not members of the International Whaling Commission. Spain, however, subsequently lodged an objection to a quota on fin whales established during the 1979 meeting of the Commission. The quota will be reexamined at the 1980 meeting, and NOAA has urged Spain to abide by the Commission's decision.

The National Marine Mammal Laboratory was established in Seattle, Washington, in 1979 to coordinate NOAA's marine mammal research and to provide specific information needed to manage and protect these animals. The Laboratory is involved in an ecosystem study relating commercial fishing operations and offshore energy development to possible changes, past and future, in marine mammal populations.

NMFS biologists have obtained substantial new information on the status of porpoise stocks involved in the tuna purse seine fishery of the eastern tropical Pacific. Some of the species appear to be less abundant (in relation to pre-exploitation levels) than had been expected. The U.S. tuna fishermen have made major improvements in porpoise conservation, and all porpoise stocks are probably increasing. Formal hearings to address changes to tuna-porpoise regulations are scheduled for the spring of 1980.

With the help of scientists, conservationists, and management experts from all over the world, the World Conference on Sea Turtle Conservation (in November 1979) focused the combined experience of many countries on the problem of improved protection for sea turtles. Significant progress by our Southeast Fisheries Center was reported in regard to both gear development and our "head-start" program for the Kemp's Ridley turtle. Additional biological information has also been developed, providing a better understanding of the distribution and abundance of turtles. This new information, fishing gear improvements, and population recovery strategies recommended by the Conference participants will assist in the protection of these threatened and endangered species.

Habitat protection

During 1979, NMFS was actively involved in regional habitat protection cases, such as the proposed Portsmouth Refinery at Hampton Roads, Virginia, the proposed Pittston Refinery at Eastport, Maine, and Outer Continental Shelf Lease Sales on Georges Bank and in the Beaufort Sea. In conjunction with the Department of the Interior's Fish and Wildlife Service, draft regulations were prepared for implementation of the Fish and Wildlife Coordination Act. For the first time, these regulations will standardize all Federal agency procedures relating to fish and wildlife resources associated with Federal water resources development projects and Federally-approved permits, leases, and licenses.

In response to the National Ocean Pollution Research and Development and Monitoring Planning Act of 1978, NOAA developed the first Federal Plan for Ocean Pollution Research, Development, and Monitoring. This plan, the first comprehensive effort for coordination of Federal marine pollution research, was submitted to Congress in December 1979. It provided a summary analysis and inventory of the marine pollution research conducted by NOAA, as well as by other Federal agencies, and recommended priority areas for research. NOAA has also planned a pollution monitoring program along the Northwest Atlantic coast.

Particular emphasis continues to be placed on our testimony at the Environmental Protection Agency's adjudicatory hearing on the Pittston Refinery, Outer Continental Shelf lease sales, State Coastal Zone Management Program participation, assistance and review, and completion of the Fish and Wildlife Coordination Act regulations. NMFS involvement has increased in its review of wetlands alteration permit applications in the Southeast, and in its review of a proposed major oil refinery on the coast of North Carolina.

Utilization and development

The Fishery Conservation and Management Act (FCMA) seeks to "encourage the development of fisheries which are currently underutilized or not utilized by U.S. fishermen." With this purpose as a framework, the Administration in FY 79 set forth a major policy initiative to foster the economic growth and development of the domestic fishing industry. The specific goals of the initiative are to improve management of domestic fisheries, reduce the $2 billion U.S. fisheries deficit, increase employment and the Gross National Product, and improve the nutritional quality of the American diet. To accomplish these goals, the NMFS Office of Utilization and Development and the NMFS Regions and Centers will continue to deal with industry productivity, fishery product quality and safety, nutritional value of seafoods, marketing efforts both domestic and international in scope; and with the information needs of consumers, government agencies, and the industry. NMFS will also continue to promote the development and use of aquaculture by increasing the harvest of certain fish and shellfish that are in short supply and high demand. In addressing these concerns, NMFS is developing a partnership with both the fishing industry and consumers to ensure that programs provide Federal assistance where needed.

Our programs concentrate on the development of nontraditional species, such as bottomfish off Alaska and squid off the east coast, and the expansion of the industry into new areas, such as tuna in the Western Pacific. Federal policy is to develop all sectors of the U.S. fishing industry--including U.S. processing, marketing, and fishing (in the 200 mile zone, in the inland waters, and among our distant water fleets) -- through a close working relationship and well-coordinated Government programs.

A major segment of the Fisheries Development effort is a $10 million program to provide financial assistance to the private sector for fisheries development projects. The program was initiated in November 1979 by a notice in the Federal Register calling for project proposals. Two deadlines--February 8, and April 1, 1980--were set for persons or groups requesting financial assistance. The purpose of the program is to develop and strengthen the U.S. fishing industry and to increase the supply of wholesome, nutritious fish and fish products.

The NMFS Office of Utilization and Development has three Divisions: Fishery Development; Financial Services; and Seafood Research, Inspection and Consumer Services. Activities of these Divisions and field activities follow.

Fisheries development

In 1979, the NMFS Fisheries Development Division (FDD) was reorganized to respond more efficiently to increasing demands of fisheries development. The Division now comprises the Export and Domestic Market Development Branch, the Industry Analysis Branch, the Regional Program Review and Coordination Branch, and the Regulations Staff Group. The major concern of the Fisheries Development Division is to establish new fisheries for underutilized and nontraditional species in the U.S. FCZ. The Division encourages fisheries development by:

- supporting research to identify and remove the major impediments to development on a species-by-species and geographic basis;

- encouraging comprehensive regional and national planning to mobilize private sector ventures into underutilized species;

-supporting the development of critical technologies and assisting in their transfer to the domestic industry;

-identifying potential for expansion of fishery products in domestic and foreign markets and facilitating that expansion;

-disseminating information on fisheries development to all potential participants; and

-evaluating Federal support programs to determine how Federal resources can be targeted most productively.

FDD coordinates activities at all levels, establishes uniform program criteria and priorities, recommends funding, assesses the economic feasibility of projects, and encourages regional participation in monitoring progress and evaluating results in view of Administration policies.

Administration fisheries development legislation

An Administration-sponsored bill to establish a program for the further development of the U.S. fishing industry, with particular emphasis on new and nontraditional fisheries, was drafted in 1979 for introduction in Congress in January 1980. This bill would have made S-K funds available through the appropriation process, provided direction and funding for fisheries development, and set up a vessel loan guarantee program for vessels entering non-traditional fisheries.

Export and domestic market development

During 1979, the Export and Domestic Market Development Branch participated in a variety of activities to promote U.S. seafood products in overseas markets (with particular emphasis on underutilized or non-traditional species). These activities included:

- leading a sales mission to Tokyo and Sapporo, Japan, in June 1979;

- participating in the "ANUGA" World Food Market in Cologne, West Germany, September 8-13, 1979;

- attending Fish-Expo '79 in Seattle, Washington, October 1979; and

- attending the 2nd International Seafood Conference in Marbella Spain, November 1979.

Other projects begun in 1979 which are part of the market program, namely:

- A contract effort is in progress to develop, by species, a computer data base of foreign seafood buyers and potential U.S. exporters.

- A contract has been let to develop basic seafood marketing tools (fish and shellfish fact sheets) in various foreign languages.

- Work progressed with the U.S. Department of Agriculture to test the acceptability of domestic fish products in the school lunch program. Currently, most fish products used in the school lunch program are imported.

- A contract effort is in progress to develop indicators for evaluating injury to the U.S. fishing industry from imports.

- And information on trade barriers in foreign countries was gathered and position papers were written to support negotiations with foreign countries fishing in the U.S. FCZ.

Export and domestic market study

Results were published of a $400,000 study of the market structures and trade barriers of 16 African, European, and Far Eastern countries for species of fish which, although abundant off U.S. coasts, are seldom used domestically. Copies of the study ("Wexler" study) were made available to the public.
This study also examined the capability of the

U.S. fishing industry to provide products for these markets.
By examining market structure, pricing mechanisms, and trade barriers, the study identified potential foreign and domestic market areas and gave the U.S. fishing industry information on marketing techniques, prices, and product types and demands.

Vessel safety

Through NMFS support and technical assistance, industry, academia, and Government agencies have made progress in addressing specific issues concerning the safety of fishing vessels and crew.
NMFS cooperated with the Office of Sea Grant in supporting the Fishing Vessel Safety Center at the University of Washington to enable it to reach Pacific Northwest and Alaska fishermen through seminars, demonstrations, and publications on safety issues of concern to those fishermen.
The Society of Naval Architects and Marine Engineers (SNAME) received aid from NMFS in funding three research studies that address different aspects of fishing vessel stability.
NMFS offers technical assistance to the U.S. Public Health Service (PHS) which is seeking to expand PHS health and safety services to all eligible commercial fishermen.

Industry analysis efforts

The FDD staff provided technical coordination for the contract report, "Prospectus for Development of the United States Fisheries" and worked with the Department of Commerce Task Force on Fisheries Development for the National Conference on Fisheries Development, held on May 23-24, 1979.
The staff critiques fishery management plan documents from the viewpoint of fisheries development and utilization. One staff member served as the coordinator of the Surf Clam and Ocean Quahog Fisheries Management Plan.
Following the successful 1978 demonstration of equipment for processing whiting, the New England Fisheries Development Program (NEFDP) funded a project to determine the commercial feasibility of producing frozen whiting fillet blocks. Approximately 100,000 pounds of frozen blocks are being produced and will be offered to secondary processors for comparison with products currently being imported. A European market information system was established by the end of 1979, and the dissemination of a weekly European market report begins January 9, 1980. The Market News Branch distributes this weekly report via an automatic telephone message center (617-283-5883), as well as providing other information services. For example, the Market News Branch of the Northwest Region publishes fish prices concerning Boston, Gloucester, and New Bedford, Massachusetts; and on New York.
With arrangements completed in May for its use, a Western Union FYI (For Your Information) News Alert service to TWX and Telex subscribers has greatly enhanced the rapid dissemination of current fishery market information.
The Southeast Region implemented a regionwide cooperative program for coastal pelagic and demersal underutilized species. This program involves state agencies, academic institutions, other Federal agencies, and industry.
Having received S-K funds, the Alaska Fisheries Development Foundation (AFDF) began fishery development projects for FY79. The AFDF formulated a long-range program to assist industry in developing U.S. fishery resources off Alaska. AFDF also undertook a cooperative study with the Economic Development Administration, the State of Alaska, and industry to evaluate infrastructure requirements needed by industry and communities to use fisheries resources off Alaska.

Seafood research, inspection and consumer services

The Seafood Research, Inspection, and Consumer Services Division (SRICSD) was recently formed through combining the Seafood Quality and Inspection Division and the Consumer Affairs Division. The new Division structure includes three branches: (1) the Standards, Specifications, and Labeling Branch; (2) the Inspection Services Branch--which includes the Northeast Inspection Office (Gloucester, Massachusetts), the Southeast Inspection Office (St. Petersburg, Florida), and the Western Inspection Office (Bell, California); and (3) the Consumer Affairs Branch. In addition, this Division includes the National Seafood Inspection Laboratory located in Pascagoula, Mississippi, and a headquarters staff which coordinates all NMFS seafood quality and safety research.

During Calendar Year 1979, the total amount of edible fishery products inspected under the Voluntary Inspection Program was approximately 596 million pounds. Fifty nine plants participated in the Packed Under Federal Inspection (PUFI) programs, 10 plants under the Sanitary Inspected Fish Establishment (SIFE) program, and 24 plants under the Military Procurement Inspection program. That is a total of 93 fishery products processing facilities in American Samoa, Puerto Rico, and the United States.

Members of this Division visited Japan in June as part of the NMFS Industry Trade Mission. The mission toured plants and markets and interviewed Government and industry representatives, inspection groups, and importers. The participants gave special attention to import inspection procedures, Government regulations on food sanitation and additives, Government requirements for labeling, and industry quality standards being applied to seafood products in Japan.

The Division recommended quality standards for minced fish blocks and a general standard for fresh or frozen fish fillets in 1979. These standards were promulgated as permissive regulations. The general standard for fresh or frozen fish fillets allows the producers of any species of fillets to market and label them as U.S. Grade A, B, or C quality. The quality standards for minced fish blocks will allow processors to purchase minced fish blocks on the basis of specific quality. In cooperation with industry and trade associations, three shrimp workshops were held to standardize the use of a regulatory three-classification system for determining decomposition in fresh, frozen, and cooked shrimp which exceed established regulatory limits and are subject to seizure and destruction or reexport.

The U.S. Army Research and Development Command Laboratories (Seafood Identification Project) at Natick, Massachusetts, continued research and development activities of the Nomenclature Projects. The Laboratory studied basic edibility characteristics of selected species using sensory and instrumental measurements. In July, a Nomenclature Workshop was held in Washington, D.C., for the Review Committee and other interested parties. The workshop agenda included a review of completed and ongoing tasks and a series of presentations outlining the tasks scheduled for FY80.

To improve the communication and coordination of research in seafood quality and safety, NMFS and FDA have agreed to develop a memorandum of understanding. Currently FDA, with the cooperation of NMFS, effected two research studies on ciguatera. In addition, a joint workshop was held to plan a cooperative interagency research program on marine toxins. This type of research is needed before some species of reef fish can be fully developed and safely marketed for public consumption.

The Divison issued four nutrition research grants for the following studies: "Cholesterol Levels in Shrimp," "Cooking Effects on Nutrition," "Seasonal Nutritional Variation," and "Content of Mineral Elements and

Bioavailability of Calcium, Iron and Zinc in Fish."

The Consumer Affairs Branch of the Division will continue many of the services which the National Fishery Education Center in Chicago, Illinois, provided before it closed in October 1979. These include the quarterly releases of seafood recipes and photographs to food editors and the dissemination of educational and informational materials to the general public.

Responding to the President's effort to increase public participation in the Federal Government, the Division and the Office of Resource Conservation and Management cosponsored a consumer workshop. It was held at the Department of Commerce for various consumer interest groups in the Washington, D.C., area. Participants included NMFS representatives, two Marine Fisheries Advisory Committee members, and the vice-Chairman of the South Atlantic Fishery Management Council. The workshop program included presentations on the Fishery Conservation and Management Act, the functions and memberships of the Councils, and methods of providing a continuing dialogue between NMFS and consumers.

The Division staff continued to participate in the seafood segment of the USDA Procurement Workshops for School Lunch Food Service personnel. The workshops provide information on writing specifications and on procurement techniques used in purchasing various food commodities. In addition, members of the Division participated in five regional seafood seminars given by the National Institute of Food Distributor Associates, Inc., (NIFDA), and presented the seafood inspection and grading segment of the workshop for the Department of Commerce.

The Division's consumer service staff took part in panel discussions at four regional seminars cosponsored by the National Fisheries Institute (NFI) and the Food Marketing Institute (FMI). Topics discussed included information about consumers, ideas for seafood retailing, new developments in sanitation and quality assurance, and services provided by NMFS.

Financial services

Financial services are provided to the fishing industry under five authorities. They are the Fishing Vessel Obligation Guarantee, the Fishing Vessel Capital Construction Fund, the Fisheries Loan Fund Program, the Fishermen's Guarantee Fund, the Fishing Vessel and Gear Damage Compensation Fund, and the Fishermen's Contingency Fund.

The Fishing Vessel Obligation Guarantee Program (46 U.S.C. 1271 et seq.) is continuing to expand. The Division approved a total of $109 million in guaranteed loans for the debt portion of fishing vessel construction and reconstruction costs in 1979. The total of outstanding guarantees, approved cases awaiting closing, and pending applications is now

$310 million. Guaranteed financings closed in 1979 had an average interest rate of 10 percent. Fees generated from program operations pay all administrative expenses and capitalize a loss reserve fund.

The Fishing Vessel Capital Construction Fund Program (44 U.S.C. 1177 et seq.), a tax deferral program, continued to generate equity capital for vessel construction and refurbishing. During 1979, 556 fishing vessel owners entered into CCF Agreements, bringing the total to 2,086 agreements since the program began. Agreement holders deposited $89 million of operational income into the Fund in 1979 and withdrew $51 million for vessel projects.

The Fisheries Loan Fund Program (16 U.S.C. 742c) continued under moratorium during 1979.

The Fishermen's Guaranty Fund Program, part of the Fishermen's Protective Act (22 U.S.C. 1971 et seq.), which indemnifies U.S. vessels against the risks of fishing off foreign coasts, insured 156 U.S. vessels in 1979. Thirty seizure claims (6 seizures by Brazil, 16 by Canada, 4 by Costa Rica, 3 by Mexico, and 1 by Venezuela) with estimated settlements totaling $650,000 were submitted in 1979.

The Fishing Vessel and Gear Damage Compensation Fund (22 U.S.C. 1980) provides direct compensation to U.S. fishermen for losses of three types:

(1) vessel or gear damage caused by a foreign vessel;

(2) gear damage caused by a domestic vessel; and

(3) gear damage caused by acts of God.

Final rules and regulations governing the program were published in the Federal Register on October 25, 1979.

The Division received 564 claims, approved 125, and disbursed $85,000 in CY 1979. Approximately 500 of the claims resulted from Hurricane David in September, and processing was not completed until 1980. At the end of 1979, 439 claims remained to be completed, but 389 of these have been disbursed as of April 1, 1980.

The Fund is capitalized by a surcharge (not to exceed 20 percent) of annual fees paid by foreign fishermen in the U.S. FCZ. In CY 1979, this surcharge was collected at the 10 percent level and amounted to $1.5 million.

The Fishermen's Contingency Fund (FCF), Title IV of the Outer Continental Shelf Lands Act Amendments of 1978 (43 U.S.C. 1841), provides compensation to U.S. commercial fishermen for vessel, gear, and economic loss resulting from obstructions related to oil and gas exploration, development, and production on the Outer Continental Shelf. The program will be funded from assessments on holders of Outer Continental Shelf leases, permits, easements, or right-of-ways. Final regulations implementing the Fishermen's Contingency Fund will be published in the Federal Register on January 24, 1980. A team of financial assistance specialists visited the Gulf of Mexico in February and March 1980 to help fishermen complete their claims. After being processed by FSD, these claims will be submitted to an administrative law judge for disposition. During calendar year 1979, 111 claims totaling $365,699 were received; 108 from the Gulf of Mexico, 1 from the South Atlantic, 1 from the Pacific, and 1 from the North Atlantic.

Management

The Fishery Conservation and Management Act of 1976 (FCMA) has been in operation for 3 full years. The first years were initially focused, by necessity, on start-up issues, but progress is now plainly visible at a different and more substantive level. Increased understanding of the Act and its operation and a better sense of partnership with the Regional Fishery Management Councils in the fishery management decision process have provided a challenging and realistic vision of the U.S. fisheries resources potential for the 1980's.

The FCMA introduced new concepts and problems. For example, the concepts of "maximum sustainable yield" and "optimum yield" developed and were clarified. Optimum yield (OY) is defined further in the following discussion. Similarly, many specialized problems have arisen (for example, the fishing rights of the native Indian tribes has been a complex situation). The following discussion highlights NMFS FCMA management activities, which are presented in more detail in the 1979 Annual Report to Congress on the FCMA.

Fisheries management plans

As of December 31, 1979, there were 33 fisheries governed by either a fishery management plan (FMP) or a preliminary fishery management plan (PMP). Nine FMP's governed fisheries from New England to Alaska (Atlantic groundfish, Atlantic herring, surf clam and ocean quahog, stone crab, Pacific salmon, northern anchovy, Gulf of Alaska groundfish, Alaska salmon, and Tanner crab). Ten PMP's also regulate foreign fishing (i.e., foreign trawl fisheries of the Northwestern Atlantic, Atlantic hake, Atlantic billfishes and sharks, Bering Sea herring and Bering Sea groundfish, Atlantic squid, Atlantic mackerel, Bering Sea snails, Bering Sea shrimp, and Seamount groundfish. Ten more FMP's were submitted in 1979 and are in the public review/implementation process: Atlantic butterfish, Atlantic squid, Atlantic mackerel, Gulf of Mexico shrimp, Gulf of Mexico reef fishes, precious coral of the Western Pacific region, Pacific groundfish, Jack mackerel, Bering-Chukchi Sea herring, and Bering Sea groundfish. NMFS expects an additional nine FMP's to be submitted for approval within the calendar year of 1980 (Gulf of Mexico spiny lobster, Gulf of Mexico shark, Gulf of Mexico corals, Gulf of Mexico and South Atlantic coastal pelagic species (mackerel), Caribbean spiny lobster, Caribbean shallow-water reef fish, Pacific pink shrimp, and Atlantic billfishes and sharks). Eventually most major fisheries will be covered by an FMP.

Atlantic FMP's

Atlantic groundfish plan for haddock, cod and Yellowtail flounder (42 FR 14002, Mar. 14, 1977)

Atlantic herring fishery of the Northwestern Atlantic (43 FR 60479, Dec. 28, 1978)

Surf clam and ocean quahog (42 FR 60438, Nov. 25, 1977)

Stone crab fishery of the Gulf of Mexico (44 FR 18031, Mar. 26, 1979)

Pacific FMP's

Commercial and recreational salmon fisheries off the coasts of Washington, Oregon, and California (42 FR 2142, Apr. 26, 1977)

Northern anchovy fishery (43 FR 31655, July 21, 1978)

Groundfish of the Gulf of Alaska (43 FR, 17242, Apr. 21, 1978)

Commercial Tanner crab off the coast of Alaska (43 FR 21175, May 16, 1978)

High seas salmon fishery off the coast of Alaska East of 175 East longitude (44 FR 29080, May 18, 1979)

As of January 1, 1980, the following PMP's were in effect (citation is publication date of plan):

Atlantic PMP's

- Atlantic billfishes and sharks (43 FR 3818, Jan. 27, 1978)

- Foreign trawl fisheries of the Northwestern Atlantic (42 FR 9950, Feb. 17, 1977)

- Hake fisheries of the Northwestern Atlantic (42 FR 10146, Feb. 18, 1977)

- Mackerel fishery of the Northwestern Atlantic (42 FR 9952, Feb. 16, 1977)

Pacific PMP's

- Seamount groundfish fishery of the Pacific (42 FR 8568, Feb. 10, 1977)

- Snail fishery of the Eastern Bering Sea and Gulf of Alaska (42 FR 12386, Mar. 3, 1977)

- Trawl fisheries and herring gillnet fishery of the Eastern Bering Sea and Northeast Pacific (42 FR 9298, Feb. 15, 1977)

- Trawl fisheries of Washington, Oregon, and California (42 FR 8578, Feb. 10, 1977)

- Shrimp of the Eastern Bering Sea and Gulf of Alaska (42 FR 12386, Mar. 3, 1977)

Indians and salmon and the FCMA

Under the FCMA, management of the salmon fisheries in the FCZ must be consistent with the provisions of the FCMA and "other applicable law." Treaties between the United States and various Indian tribes (including intermediate and settlement orders binding upon the United States) constitute such other applicable law. Four Columbia River tribes (Boldt Case Area tribes) have judicially recognized off-reservation treaty fishing rights. In addition, the Shoshone-Bannock Tribe of the Fort Hill Reservation of Idaho has treaty fishing rights in southern Idaho, and Indians of the Hoopa Valley Reservation in California have Federally-reserved fishing rights.

Boldt Case Area tribes have a right to harvest a maximum of 50 percent of all salmon that would reach their usual and accustomed fishing grounds, without prior interception by non-Indian citizens of Washington State. In 1979, the U.S. Supreme Court indicated that the Secretary of Commerce must manage the harvest of salmon by non-Indian Washington citizens in the FCZ to comply with the treaties. This responsibility is shared with State agencies and Indian tribes which have management authority in the territorial sea and internal waters of the State of Washington.

The U.S. Supreme Court's decision states that neither the share of salmon taken by treaty Indians nor the share taken by other Washington State fishermen should be affected by the place where the fish are taken. Thus, all salmon taken from runs that are destined to pass through the "usual and accustomed" Indian fishing grounds, which are caught in any portion of the FCZ or caught and landed within Washington territorial waters, are to be counted towards the appropriate shares.

For purposes of managing the salmon fisheries in the FCZ, the Secretary should manage on a run-by-run basis; however, until such a management system becomes practicable, the present system, based on an aggregate of runs, must be used.

The Columbia River tribes have treaty fishing rights comparable to those of the Boldt Case Area tribes. The tribes, however, have entered into an agreement with the States of Oregon and Washington and the Federal Government, known as the Columbia River Agreement. Under this agreement, the harvest of salmon in the ocean is regulated so that the harvest of salmon destined for the Columbia River and its tributaries above Bonneville Dam, other than fall chinook and coho salmon, will be a de minimus portion of those

runs, and that there will be a minimum average in-river run of 300,000 upriver fall chinook to the Columbia River.
The Secretary may regulate the salmon harvest of treaty Indian tribes having usual and accustomed fishing grounds in the FCZ only if such regulation is necessary and appropriate for conservation of the resource. Four Washington State tribes have recognized fishing grounds in the FCZ. Although the FCMA vests exclusive management authority over all fishing in the FCZ in the Secretary, such authority must be exercised in a manner consistent with the rights of treaty fishermen.
The management measures adopted by the Pacific Fishery Management Council for the 1980 salmon fisheries were designed to assure compliance with Indian fishing rights. As a result, the 1980 harvest of salmon in the FCZ by non-Indian commercial and recreational fishermen should be reduced from levels attained in recent years.

Definitions of Optimum Yield (OY)

Without exception, each FMP deals with complex and volatile issues. Substantial progress is being made by the Councils to resolve problems, but not without difficulty. One of the most contentious and difficult issues is the application of the "optimum yield" concept. The Act defines optimum yield as the amount of fish (1) that will provide the greatest overall benefit to the Nation, with particular reference to food production and recreational opportunities, and (2) which is based on the maximum sustainable yield, as modified by relevant economic, social, or ecological factors. The concept of OY is intended to ensure that the many demands upon a fishery resource are considered in a balanced fashion. Thus, the need to restore or conserve the resource itself is to be considered together with the needs of the commercial, recreational, consumer, and other affected interests. Often these interests are in conflict. For example, when a reduction is required in fishing effort to rebuild a stock, how should the burden be spread among commercial and recreational fishermen? Trawl gear permitted in some areas may reduce juvenile populations of a non-target species, thereby threatening future stocks, or its use may conflict with fixed gear employed in another fishery.
To arrive at an OY, the objectives for the fishery must be clearly defined and alternative strategies to meet these requirements must be proposed and analyzed in terms of their effect on different groups. These demands can be met only with sufficient biological, economic, and social data, and satisfactory techniques for performing the analyses. When the alternatives have been evaluated, the selection still must be made for the most desirable course. This is a matter of judgment since it involves balancing the various demands of the fishery.
We are attempting to improve our understanding of the social, economic, and environmental factors that are relevant to a determination of OY and the allocation of fishery resources. Accordingly, in cooperation with the Councils, we are examining some of the problems associated with allocations. We have sponsored workshops on OY, a key factor in making allocations, and on limited entry, a controversial issue throughout the country.

Fisheries development and the FCMA

Relation of resource management to fisheries development

Two objectives of the FCMA are (1) to promote domestic commercial and recreational fishing according to sound conservation and management principles, and (2) to encourage development of fisheries currently underutilized or not utilized by U.S. fishermen. The primary emphasis for implementation to date has been to rebuild depleted stocks and to maintain other stocks at their optimum levels. This in itself has done a great deal to stimulate development of fisheries, as noted earlier. Because of this emphasis, however, the implicit relationship of fishery management to fishery development has not received the attention it merits.

Replenishment of the stocks and enhancement of the U.S. fishing industry has required increased regulation of the fishing done by foreign fishermen within the FCMA areas. Consequently there is increasing control of fishing permits, and of ventures which conjoin U.S. fisheries with foreign processing and marketing.

Foreign fishing permits

A total of 1,174 applications for fishing permits were made in 1979, 255 less than in 1978. The number of permits issued decreased from 945 to 912. More permits were issued to fishing vessels in 1979 than in 1978, whereas 54 fewer permits were issued to support vessels. (See tables 1 and 2 for additional information.)

Table 1 Foreign fishing under FCMA, status of applications/permits (1979) (numbers indicate vessels for which applications have been submitted)

Nation	Submitted	Revoked[1]	Withdrawn	Disapproved[2]	Approved, no permits issued	Sanction[3]	Permits issued
Euro. Economic Community							
Ireland	1	0	0	0	0	0	1
Italy	21	0	1	0	7	0	13
Other nations							
Bulgaria	8	0	8	0	0	0	0
Cuba	23	0	23	0	0	0	0
German Demo. Republic	4	0	0	0	4	0	0
Japan	584	1	2	0	29	0	552
Mexico	33	0	0	0	11	0	22
Poland	54	0	0	0	35	0	19
Rep. of Korea	33	0	0	0	1	0	32
Romania	7	0	0	0	6	0	1
Spain	116	0	1	0	1	0	114
Taiwan	22	0	0	9	0	1	12
U.S.S.R.	268	0	0	0	122	0	146
Totals	1,174	1	35	9	216	1	912

[1]Non compliance with FCMA.
[2]Applications were disapproved when submitted for vessels to engage in fisheries for which the nation had no allocations.
[3]Sanction for non payment of civil penalty.

Foreign governments were charged about $20.8 million in poundage and permit fees during 1979. (See table 3.) More than $5 million of the poundage fees will be refunded, because the foreign fishermen did not harvest the allocated resources. The fee schedule for 1979 was essentially the same in 1977 and 1978. The poundage fee for 1979 was based on landing data for 1977.

Joint ventures

NOAA published interim final regulations on February 7, 1979, after considering public comments on previously proposed regulatory amendments. The proposed amendments had been published on October 20, 1978, to implement the "joint venture" amendment of the FCMA, P.L. 95-354. The interim final regulations amended 50 CFR Part 602, Guidelines for the Development of Fishery Management Plans. The February 7

Table 2 Foreign fishing under FCMA, permits issued (1979)

		Permits Used		By Fishery		
Nation	Total permits issued[1]	Fishing vessels	Support vessels	Fishery	Fishing vessels	Support vessels
Euro. Economic Community						
Ireland	1	1	0	NWA	1	0
Italy	13	13	0	NWA	13	0
Other nations						
Japan	552	419	133	ABS	117	2
				BSA	249	133
				CRB	24	106
				GOA	62	129
				NWA	16	89
				SMT	2	27
				SNA	18	88
Mexico	22	22	0	GOA	5	0
				NWA	14	0
Poland	19	17	2	BSA	14	2
				GOA	14	2
				NWA	11	1
				WOC	14	2
Romania	1	1	0	NWA	1	0
Rep. of Korea	32	19	13	BSA	18	11
				GOA	19	12
Spain	114	114	0	NWA	114	0
Taiwan	12	11	1	BSA	11	1
U.S.S.R.	146	92	54	BSA	81	46
				GOA	81	46
				NWA	11	8
				WOC	78	46
Totals	912	709	203			

[1]The sum of total permits issued is less than sum of fishery figures because of permits issued for two or more fisheries.

interim regulations required fishery management plans to contain information regarding: (1) historical and projected transfers of U.S.-harvested fish to foreign vessels at sea, (2) the processing capacity of U.S. fish processors, and (3) the data which FMP's may require U.S. fish processors to submit to the Secretary of Commerce.

Concurrently, an Advance Notice of Proposed Rulemaking was published which invited public comment on: (1) guidelines for establishing U.S. harvesting capacity, (2) activities which should be considered "fish processing", and (3) guidelines for developing conditions and restrictions on foreign fishing permits for receiving U.S.-harvested fish.

Comments on the proposed rulemaking were under review at year's end. All joint venture applications received in 1979 were reviewed under the provisions of the interim regulations.

"Joint Venture" applications were approved and permits were issued to vessels of South Korea and the Soviet Union in 1979. South Korean and Soviet vessels received U.S.-harvested groundfish in the Gulf of Alaska groundfish fishery. The Soviet vessels were restricted from retaining sablefish in amounts in excess of 1.5 percent of the total catch received from U.S. fishermen. A similar restriction was proposed to be included on the Korean permit, but it was not imposed because the Korean operations approached termination before all administrative requirements for imposing the restriction were met. Soviet vessels also were permitted to receive U.S. harvested Pacific whiting in the Washington, Oregon, California trawl fishery.

Table 3 Fishing permit fees charged for calendar years 1978 and 1979 (in dollars)[1]

	Poundage fees		Permit fees		Total fees	
Nation	1978	1979[2]	1978	1979[2]	1978	1979[2]
Bulgaria	105.35	—	2,867.00	—	2,972.35	—
Cuba	—	—	—	—	—	—
European Eco. Community						
FRG	—	—	—	—	—	—
Ireland	—	3,422.94	—	1,921.00	—	5,343.94
Italy	71,967.96	135,566.78	22,181.00	22,341.00	94,148.96	157,907.78
Japan	5,959,278.97	6,957,187.02	298,190.00	268,613.00	6,257,468.97	7,225,800.02
Korea	354,576.20	883,123.49	57,949.00	65,240.00	412,525.20	948,363.49
Mexico	59,089.63	243,616.41	12,009.00	19,231.00	71,098.63	262,847.41
Poland	37,291.21	304,344.79	28,464.00	105,657.00	65,755.21	410,001.79
Romania	2,666.63	—	2,681.00	—	5,347.63	—
Spain	201,231.07	256,349.56	20,304.00	45,610.00	221,535.07	301,959.56
Taiwan	11,148.85	14,022.93	6,377.00	7,804.00	17,525.85	21,826.93
U.S.S.R.	2,057,743.48	2,232,047.19	312,743.00	381,774.00	2,370,486.48	2,613,821.19
Totals	8,755,099.35	11,029,681.11	763,765.00	918,191.00	9,518,864.35	11,947,872.11

[1]The fees listed for 1978 and 1979 are after refunds of fees for uncaught allocations.

[2]The fees listed for 1979 do not include the 10 percent surcharge for the Fishing Vessel and Gear Damage Compensation Fund.

Marine recreational fisheries

During 1979, the Washington Office continued to coordinate marine recreational fisheries activities at the national level. These activities included cosponsorship of the 4th Annual Marine Recreational Fisheries Symposium and periodic meetings with national and regional leaders of the recreational fishing and conservation community. Also in late 1978, NMFS initiated a survey of marine recreational fisheries to collect information on the number of fishermen, their effort, and their catch. Since most species of marine finfish are harvested by both commercial and recreational fishermen and since the recreational catch exceeds that of the commercial fishery for many species, this information is critically needed for management purposes. Results of the first year's survey are scheduled to be available in mid 1980. Also, during the year, a draft "Program Overview for Marine Recreational Fisheries" was prepared as a concept paper, with the express purpose of stimulating the private sector and the Federal and State government agencies to work together to meet recreational fisheries needs while protecting the resource.

Recreational fisheries are increasingly becoming integral parts of the fishery management system. The activities of the Regional and Center Offices are summarized as follows:

Northeast Region and Northeast Fisheries Center

Recreational fisheries personnel in the Northeast Regional Office spent much of their time in 1979 working on bluefin tuna matters. These activities included holding and participating in public hearings on regulations for the domestic bluefin tuna fisheries, and monitoring the domestic catch of bluefin tuna. Also monitored were the charter and party boat catch of cod and haddock; this information was given to the New England Fishery Management Council. Additional activities included collecting specific information on bluefish and striped bass fisheries in the Mid-Atlantic area, and communicating regularly with numerous recreational fisheries constituents.

Biological and ecological studies of oceanic gamefish concentrated on the large sharks of the Northwest Atlantic. More than 2,000 cooperating fishermen on the American and European Atlantic coasts helped to tag 5,310 sharks of 34 species. Tags were returned from 166 sharks of 15 species. These returns gave important information on the movements, foods, growth rates, reproduction, and physiology of sharks. Program personnel were able to study the remains of a 2,075 pound male white shark harpooned off Long Island.

Southeast Region and Southeast Fisheries Center

During 1979, the Recreational Development Services Branch in the Southeast Regional Office continued efforts to facilitate development of marine recreational fisheries in the Region. Specifically, the Branch continued to improve mailing lists and other lines of communication with saltwater sport fishermen; assisted in implementation of the 1979 National Recreational Fishing Survey as well as planning for the 1980 National Survey; assisted in planning and conducting a regional artifical reef conference; assisted in development of FMP's for recreationally significant species; and participated in state outdoor recreational planning programs in order to identify and address saltwater recreational fishing access and facility development needs.

Southeast Fisheries Center personnel continued to address marine recreational fisheries research and data collection needs relating to the conservation and management of oceanic

pelagics (billfish and sharks), reef fish (snappers and groupers), and coastal pelagics (mackerels and bluefish).

A number of notable accomplishments were made with regard to the oceanic pelagics program. Center staff completed a sailfish MSY (maximum sustainable yield) analysis for the South Atlantic Fishery Management Council; prepared stock assessment documents for bluefin tuna, blue marlin, and white marlin for a special scientific meeting of the International Commission for the Conservation of Atlantic Tuna; developed a computerized international catch data file for Atlantic bluefin tuna; and awarded a contract for the 1980 Atlantic Bluefin Tuna Sport Fishery Survey. Most notably, program personnel published the report Survey of the Recreational Billfish and Shark Fisheries. From the survey, it was determined that 85,869 billfish and 230,423 sharks were caught by sport anglers along the Atlantic and Gulf coasts of the United States during the period May 1, 1977, to April 20, 1978. On the average, 0.29 billfish and 1.2 sharks were caught per day from boats participating in these two fisheries. Sailfish were by far the most frequently caught and boated billfish.

Significant progress was also made in the reef fish management program. During 1979, live bottom and reef areas in the South Atlantic and the Eastern and Central Gulf of Mexico were surveyed and measured. Interestingly, estimates indicate that only 12.4 percent of the wide Gulf of Mexico continental shelf within the FCZ is available as habitat for reef fish. Further accomplishments included a survey of South Atlantic head boats to obtain reef fish catch estimates and development of yield/recruitment models for 11 species of reef fish.

With respect to other species, a paper was completed on the use of scanning electron micrographs of hard parts of red drum and croaker to determine the age of these fishes. Bioprofile and tagging work related to recreationally important coastal pelagics (bluefish, king and Spanish mackerel) also continued in 1979.

The Center was heavily involved in the Foreign Fishery Observer Program in 1979. Special emphasis was directed towards monitoring the Japanese tuna longline fleet to minimize the by-catch of billfish and sharks. Six observers expended 684 days of observer effort which resulted in a 21 percent coverage of the Japanese tuna longline fleet in 1979.

Southwest Region and Southwest Fisheries Center

In the Southwest Region, the California Department of Fish and Game in 1979 began creel census interviews as a participant in the NMFS Marine Recreational Fishing Survey on the West Coast. The survey involves creel census and intercept survey activities to determine catch and effort of marine anglers. The Pacific Marine Fisheries Commission is the primary contractor, with California, Oregon, and Washington serving as subcontractors for field work.

The Southwest Region and the Sportfishing Association of California, which represents the commercial passenger fishing vessels of California, jointly produced and distributed a brochure entitled, "Cook Your Catch." The brochure presents information on cleaning and preparing recreational species of fish for home consumption, and contains more than 20 recipes using such species as barracuda, white croakers (tom cod), mackerel, and rockfish. The brochure is intended to assist anglers in handling their catch and enjoying the benefits of their fishing trips more fully, and to encourage the use, rather than waste, of sport-caught fish. In addition to the brochure, educational clinics were presented at several sports, recreational, boat, and fishing tackle conventions to distribute product information and research results.

Scientists at the Tiburon Laboratory, Southwest Fisheries Center, Tiburon, California, presented evidence to the State of California Water Resources Control Board that changes in water quality of the San Francisco Bay-Delta, resulting from increasing population and industry, may have adversely affected fisheries resources. Striped bass, a species reserved for recreational fishing, was found to be in extremely poor condition in San Francisco Bay in 1979. The Water Resources Control Board established a research project involving cooperative work with the Tiburon Laboratory to investigate the striped bass problem thoroughly.

Northwest Region and Northwest and Alaska Fisheries Center

Coordination activities continued to involve liaison with the State fishery agencies, recreational fisheries organizations (sportsmen's groups), the Pacific Marine Fisheries Commission, and contracting research institutions. Information has been provided to various elements of the Pacific Fishery Management Council on recreational fishing for salmon and groundfish. The contract study on development of methodologies to obtain information on the socioeconomics of marine recreational fishing was completed in September. Copies of the final report have been distributed widely. Planning continued during FY 1979 for the Phase II contract-study to conduct the national survey to develop the socioeconomic profiles of marine recreational fishermen and fishing. The angler-intercept segment of the national statistical survey of marine recreational fishermen and fishing on the Pacific Coast has been contracted to the fishery agencies of California, Oregon, and Washington through the Pacific Marine Fisheries Commission. Assistance in developing, implementing, and monitoring these contractual arrangements, and the survey itself, has been provided through the Northwest Regional Office.

During the winter steelhead fishing season, the Northwest Regional Office operated a 24-hour telephone "hot-line" service to steelhead anglers with tape-recorded information on the levels and "fishable" conditions of western Washington steelhead rivers. These sea-run rainbow trout are the targets of thousands of Washington anglers as the fish enter streams in the fall and winter to spawn. Angling activity and success are highly dependent on river conditions, which can fluctuate rapidly in western Washington's maritime climate from low and clear to high and muddy, with the latter being an "unfishable" condition. Messages were taped on Tuesday and Friday mornings with information obtained from the National Weather Service Hydrology Office. The frequency of calls per day ranged from 20 to 200, with a seasonal average of 62; over 7,200 calls for this information were made during the 11 weeks of operation during the steelhead season.

State/Federal programs and relations

State/Federal programs are another key element of NMFS national fisheries management programs. NMFS administers three activities in this area.

Grants-in-Aid for Fisheries Program

The Commercial Fisheries Research and Development Act of 1964 (Public Law 88-309 as amended, 16 U.S.C. 779-779f) authorizes the Secretary of Commerce to cooperate with the 50 States, Puerto Rico, Virgin Islands, Guam, American Samoa, Northern Marianas, and the Trust Territory of the Pacific Islands in carrying out research and development of the Nation's commercial fisheries. Projects eligible for funding include research, development, construction, and coordination. Cost-sharing

projects are funded up to a 75 percent level of Federal participation for research and development, whereas projects to alleviate resource disasters and to establish new commercial fisheries may be financed with 10 percent Federal funds. The present base level funding is $5 million per year. Distribution of funds is made by a legislative formula established by the Act.

In 1979, 52 projects were completed at a total cost (both State and Federal) of approximately $7.8 million. There are 137 continuing projects, at different stages of activity, totaling more than $13.3 million. Alabama, Louisiana, Mississippi, and Texas received $3,574,000 in P.L. 88-309 Section 4(b) disaster assistance funds to restore oyster resources destroyed by flooding in the spring of 1979.

The Anadromous Fish Conservation Act of 1965 (Public Law 89-304 as amended 16 U.S.C. 757a.f.) authorizes the Secretary of Commerce to enter into cooperative agreements with the 31 coastal and Great Lakes States and other non-Federal interests for the conservation, development, and enhancement of the anadromous fishery resources of the Nation, and fish in the Great Lakes and Lake Champlain that ascend streams to spawn, and for control of the sea lamprey. The program is administered jointly at the Federal level by NMFS and the U.S. Fish and Wildlife Service (FWS). Federal funds up to 50 percent may be used to finance projects. The Federal share of the project cost may be increased to a maximum 66 2/3 percent when two or more states, having common interest in a river basin, jointly enter into a cooperative agreement with the Secretary.

In 1979, 15 projects were completed at an estimated cost (both State and Federal) of more than $6.7 million.

The authorization for this Act expired September 30, 1979, but was renewed in November 1979 for an additional 3 years to September 30, 1982. The new Act includes the following: (1) sets authorized funding levels at $11 million for fiscal year 1980, $13 million for fiscal year 1981, and $15 million for fiscal year 1982; (2) removes language which places the burden for costs of operation and maintenance of facilities constructed under multistate projects entirely on the states; (3) removes requirement that all title of lands acquired under the Act must rest in the Federal government rather than the state involved; (4) changes the maximum amount of funding a state may receive under Section 4(b) in any 1 year from $1 million to $1.25 million; (5) and initiates an emergency study, known as the "Chafee Amendment" to investigate causes for the decline in striped bass populations. The "Chafee Amendment" authorizes appropriations of $1.0 million in fiscal year 1980, $1.75 million in fiscal year 1981, and $2.0 million in fiscal year 1982 to be administered jointly by the FWS and NMFS. Organizational meetings and workshops have been held, and it is anticipated that field activities will begin in early spring of 1980.

State/Federal Fisheries Management Program (SFFMP)

This program was initiated by NMFS in 1971, to assist the coastal states in establishing effective management of interjurisdictional fisheries resources within state waters. The SFFMP also seeks to complement and, where possible, augment activities under FCMA to develop and implement FMP's within state waters. The approach is to: (1) work with states, through State/Federal Fisheries Management Boards, to identify and set priorities for fisheries management plan development in state waters; (2) provide financial support to the states through cooperative agreements for specific studies leading to plan development and implementation; and (3) provide financial support to and through the Interstate Marine Fisheries Commissions to facilitate overall planning, communication, and coordination for project development and implementation.

During 1979, NMFS examined the current mission of the NMFS State/Federal Fisheries Management Program with respect to changing or modifying it to meet other critical, resource-related problems/needs requiring significant State/Federal interactions directed at full implementation of the Fishery Conservation and

Management Act, Marine Mammals Protection Act, Endangered Species Act, Fish and Wildlife Coordination Act, Coastal Zone Management Act, and other legislative mandates. This analysis is continuing in cooperation with the coastal and Great Lakes States Fish and Wildlife Commission Directors, Regional Fishery Management Council Chairmen and Executive Directors, and the Executive Directors of the Interstate Fisheries Commissions and will culminate in new policy formulation in calendar year 1980.

Columbia River Fisheries Development Program (CRFDP)

The Columbia River Fishery Development Program (CRFDP), authorized by the Mitchell Act of 1938, was initiated in 1949 (Public Law 75-502, 16 U.S.C. 755-757) and was created to counteract the severe loss of salmon and steelhead trout resulting from the expansion of water-use projects in the Columbia River system. The program is managed by the NMFS and is a cooperative effort of fishery management agencies of the States of Idaho, Oregon, Washington, and the FWS.

The functions of the program are: (1) to provide planning and financial support for production of Pacific salmon and steelhead trout in the Columbia River Basin; (2) to provide hatchery and fisheries data to commissions negotiating international treaties for Pacific salmon fisheries; (3) to be a focal point for hatchery and fisheries data concerning Pacific coast anadromous salmon and steelhead trout, and provide these data upon request to fisheries scientists and administrators, State and Federal legislators, and other interested groups and individuals; (4) to conduct cost-effective and operational improvement studies in hatchery operations; and (5) to serve as a channel to link fish facility research and operational programs. Accomplishments in 1979 are discussed under activities of the Northwest Region and Center.

The following reviews State/Federal activities by NMFS Regions and Centers:

Northeast Region and Center

State/Federal Fisheries Management Program

Effective management of all species under the FCMA and the SFFMP is accomplished through a cooperative regional effort involving the Regional Fishery Management Councils, the states, and the Federal government. Although some difficulties exist, there have been numerous accomplishments.

The Center organized and held workshops to: (1) review Federal and state stock assessment activities in the Gulf of Maine and southern New England waters; and (2) evaluate aging techniques for scup.

The Northern Shrimp Management Plan was adopted by the Northeast Marine Fisheries Board in October and by the Northern Shrimp Section of the Atlantic States Marine Fisheries Commission (ASMFC) in November 1979. Management of the fishery is continuing under a joint State/Federal-ASMFC structure.

The American Lobster Fishery Management Plan, adopted by the Northeast Marine Fisheries Board in October 1978, is being used by the New England Fishery Management Council as the basis for developing an FMP for the fishery in the FCZ. State and Federal personnel involved with the State/Federal Lobster Management Program are participating in the Council's effort to develop the draft plan; thus, there is a high degree of coordination and continuity between the State/Federal Program and the FCMA in the development of management measures for both the inshore and offshore lobster fisheries.

Over the past year, the program has undertaken activities concerning analysis of the sociological structure of the menhaden fishery labor force, proximate analysis of oil-to-meal ratios of menhaden, and an inventory of operating costs of the menhaden industry. Information gained from these efforts contributed substantially to the development of

a draft Atlantic Menhaden Fishery Management Plan.

At its December 1979 meeting, the Striped Bass Sub-board established a May 1980 target date for completion of a preliminary draft management plan. Draft sections of the plan which address the historical exploitation of striped bass resources and the description of the fishery have been completed. In addition, objectives to guide overall management of the resource have been developed and are undergoing review and further refinement. Part I of a two-part workshop on striped bass population dynamics, designed to develop the assessment information necessary for preparation of a management plan, was conducted during December 1979.

Grants-in-aid for Fisheries Program

During this period, 95 Federal aid projects were ongoing. They included research, development, and improved services, with a total financial commitment of about $18.2 million. Of this number, 78 were financed under Public Law 88-309; the remaining 17 projects used monies made available through the Anadromous Fish Conservation Act, P.L. 89-304.

Southeast Region and Center

State/Federal Fisheries Management Program

State and industry members were informed of the biological status of the Gulf and Atlantic menhaden fisheries resources. Information was developed and an analysis made which resulted in an agreement on the data base, status of stocks and the recommendations of the State/Federal-industry population dynamics group for Atlantic menhaden. A yield-per-recruit model was developed for Atlantic menhaden which allows for evaluation of the effects of fishing on yield by area and for the entire fishery. Initial estimates of fishing and natural mortality rates and the pattern of recruitment were developed for the Gulf menhaden. The MSY estimates were developed for Gulf and Atlantic menhaden fisheries. A fecundity study for Gulf menhaden was completed. NMFS personnel participated on committees under the State/Federal Fisheries Management Program to determine management needs and to devise appropriate management methods to achieve optimum resource utilization by all user groups under the State jurisdiction system.

The Gulf States Marine Fisheries Commission continued to administer development of a data base for interstate fisheries management through the following work efforts: (1) menhaden tagging mortality study, (2) pilot study for a menhaden catch/effort log, (3) formalization of a menhaden information data bank, (4) simulated implementation of a menhaden information data bank, (5) shrimp recreational fisheries data collection and analysis, and (6) development of a management planning profile for spotted sea trout and red drum in the Gulf of Mexico. The South Atlantic State/Federal Board continued a pilot study to explore methods of implementing a cooperative State/Federal regional statistical program along the South Atlantic coast.

Grants-in-Aid for Fisheries Program

The eight South Atlantic and Gulf States of the Southeast Region obligated $1,330,000 in P.L. 88-309 funds on 25 projects in fiscal year 1979. Alabama, Louisiana, Mississippi, and Texas received $3,574,000 in P.L. 88-309 4(b) (disaster assistance) funds to restore oyster resources destroyed by flooding in the spring of 1979. Grants-in-Aid supported fishery research activities by providing a data base for management of fisheries resources in the territorial sea and the FCZ.

Southwest Region and Center

State/Federal Fisheries Management Program

The Southwest Region and the Southwest Fisheries Center entered into a contract with the California Department of Fish and Game, effective July 1, 1979, to survey and assess the involvement of marine mammals in established commercial and recreational fisheries in the State of California. The goals of this contract are to: (1) identify areas of conflict between fisheries operations and marine mammals; (2) assess the impact of these conflicts on the

coastal marine mammal populations; and (3) estimate economic loss (if any) to the fisheries due to depredation of catch and loss of gear. The contractor has identified marine mammal interactions in the salmon fishery, groundfish fishery, trammel and gillnet fisheries, and round haul fisheries. Marine mammals are taken incidentally in all these fisheries either by entanglement in gear or by fishermen trying to protect their gear and catch from depredation. The contractor is investigating the extent of this take and its impact on the marine mammal populations involved. The final report will discuss these impacts, make recommendations for further study, and provide the basis for development of the State/Federal marine mammal program if the state decides to apply for resumption of management authority.

The Southwest Region, the Southwest Fisheries Center, and the California Department of Fish and Game signed a cooperative data management agreement in 1979. This agreement is the first of its kind and will facilitate the collection and sharing of fisheries data for environmental assessment, management, enforcement, and development purposes.

The contract between the Southwest Region and the California Department of Fish and Game for the State/Federal coordinator position was extended in 1979. This contract facilitates communication between parties on all fisheries matters including FCMA, data management, recreational fisheries, enforcement, and the marine mammal program.

Northwest Region and Center

State/Federal Fisheries Management Program

Since late 1978, the State/Federal Program has concentrated on improving the States' collection, machine processing, and reporting of statistics needed for regional fisheries management. Under a contract with the Pacific Marine Fisheries Commission, historic vessel and landings data for California, Oregon, and Washington for the period 1974-1976 were merged and a summary file of detailed information on weekly landings by state, vessel, gear-type, species, and port of landing was created. At bimonthly meetings of the Committee on Regional Fisheries Data Consolidation, comprised of Pacific Coast state and Federal fisheries and fisheries data managers, the various data processing capabilities of the states have been analyzed in detail for completeness, quality, machine compatibility, and timeliness. Limitations in the individual state's data processing systems have been defined, providing the basis for planning and initiating action that will result in meeting FCMA requirements for timely reporting of information used for in-season and between-season management of salmon, groundfish, and shrimp fisheries. Seed money was provided to the Oregon Department of Fish and Wildlife (ODFW) to hire clerical staff to process data from fish tickets, and to purchase needed equipment to improve data processing efficiency and user access. As a result, all 1978 salmon landings information has been entered on the ODFW computer. These funds also contributed to Oregon's development of full capability in processing, summarizing, and reporting preliminary salmon landings data to meet the in-season management requirements for the 1980 ocean commercial and recreational salmon fishery. State/Federal funding will continue to advance the efforts of both Oregon and Washington in developing an operative and responsive in-season reporting system in time for the 1980 shrimp and groundfish fisheries and will extend the regional committee's work toward developing a coastwide data sharing network.

Grants-in-Aid for Fisheries Program

The Grant-in-Aid Programs, P.L. 88-309 (Commercial Fisheries Research and Development Act) and P.L. 89-304 (Anadromous Fish Conservation Act), continue to reflect heavy state commitment in meeting the demands of fisheries management under the FCMA.

Oregon's P.L. 88-309 program funds are almost exclusively devoted to sampling the groundfish and pink shrimp catch to acquire information on landings, stock condition, and fishing effort. Likewise, the bulk of Oregon's P.L. 89-304

program deals with dockside sampling of ocean troll salmon landings, and coded wire tag recovery, analysis, and reporting. A new stock assessment program in state waters is progressing in anticipation of the Pacific Fishery Management Council's Comprehensive Salmon Management Plan, currently under development.

Stock assessment, studies on population structure, and the collection of landings data for crab, groundfish, pink shrimp, and herring comprise the bulk of Washington's P.L. 88-309 program. The Washington Department of Fisheries P.L. 89-304 program in 1979 attempts to balance State needs for resource management and enhancement. Port sampling of the commercial and sport salmon fisheries catch is a continuing activity, while a significant proportion of the State's 1980 allocation under P.L. 89-304 has been obligated to begin development of a jointly-funded NMFS-FWS sockeye and fall chinook hatchery and rearing facility on the Cedar River, King County, Washington.

Alaska Region

Grants-In-Aid for Fisheries Program

The Region administered six P.L. 88-309 (Commercial Fisheries Research and Development Act) and eight P.L. 89-304 (Anadromous Fish Conservation Act) grants. Thirteen of these grants were awarded to the Alaska Department of Fish and Game and one was awarded to the Fisheries Research Institute, University of Washington. These grants were for management-oriented research on salmon and shellfish throughout Alaska.

Interstate Marine Fisheries Commissions

During 1979, the Interstate Marine Fisheries Commissions continued to work actively with their constituent states and with NMFS toward effective fishery management. The Commissions have contributed to NMFS goals, as well as to those of the states, through facilitation of regional meetings, participation in national conferences, and communications services to all fisheries agencies and fisheries users. Additionally, the Commissions have provided state-oriented feedback and advice to NMFS on policy and operations matters.

Enforcement

During 1979, NMFS special agents enforced a wide variety of Federal laws and regulations as well as provisions of various international treaties and agreements. The major enforcement emphasis during the year concerned commercial fishing activities, both foreign and domestic, regulated by provisions of the FCMA. Tables 4 and 5 summarize FCMA violations and enforcement activities in 1979.

Both foreign and domestic efforts within the U.S. FCZ are controlled principally by area and season closures, gear restrictions, and catch quotas expressed in limitations on quantity and/or effort.

During 1979, at-sea enforcement patrols by NMFS special agents were performed in cooperation with the U.S. Coast Guard and utilized Coast Guard cutters and aircraft. Other methods for maintaining compliance with fishery regulations included dockside inspections of catches, fishing gear, fishing vessels, landing records, and logbooks. The use of U.S. observers aboard foreign vessels was emphasized as an aid in maintaining compliance and was considered very effective.

Section 201(c)(2)(D) of the FCMA states that it is the sense of Congress that governing international fishery agreements (GIFA's) contain a binding commitment on the part of foreign fishing nations to permit U.S. observers aboard their fishing vessels, and that the United States "be reimbursed for the cost of such observers." The GIFA's thus serve as the basis for placing observers aboard foreign fishing vessels and billing foreign fishing nations for the cost of observer coverage. The program has two broad national objectives which are to collect biological data that describes the size and species composition of the foreign catch, and which may also be used for stock assessment purposes, and to prevent violations of the foreign fishing regulations and other applicable laws. The program is implemented through four field stations, which are located in the Northeast, Southeast, Northwest and Alaska Regions, and the Southwest Fisheries Center.

Observers have both a data collection role and a compliance role. They collect data on foreign catch and effort, and foreign compliance with fishery and marine mammal regulations, and they make biological measurements of selected species and note the incidence of marine mammals. Observers may also tag selected species, collect information on foreign catching and processing

Table 4 1979 violations of the FCMA

	NMFS Regions					
	Northeast	Northwest	Alaska	Southwest	Southeast	Totals
Reports of violation issued:	185	25	74	20	63	367
Reports of violation downgraded or dismissed:	5	3	14	0	0	22
Notices of violation issued:	36	5	18	0	0	59
Notes of assessment issued:	2	0	1	0	2	5
Violations closed with civil penalty paid:	6	15	6	0	6	33
Permit Sanctions	1	0	3[1]	0	0	4

[1]Three additional permit sanctions are in process of being executed.

Table 5 FCMA enforcement during calendar year 1979

	NMFS Regions					
	Northeast	Northwest	Alaska	Southwest	Southeast	Totals
Domestic sightings:	12,596	3,637	2,340	792	6,168	25,533
Foreign sightings:	1,863	1,187	6,916	592	1,702	12,260
Foreign boardings:	167	90	273	129	39	698
Reports of domestic violations:	177	20	5	6	7	215
Reports of foreign violations:	6	4	51	14	56	131
Domestic citations:	119	1	2	0	0	122
Foreign citations:	10	8	20	0	1	39
Foreign seizures:	1	1	11	0	1	14

technology, advise masters of infractions, confer with masters on actual weight of catch, and summon the U.S. Coast Guard for immediate action on serious violations. Observers do not have enforcement authority.

Optimum observer coverage varies from fishery to fishery for biological, compliance, and management reasons. As a general rule, coverage needs to be established at the 20 percent level to meet all program objectives, but in some fisheries, coverage needs to be increased considerably above the 20 percent level to assure compliance or to collect stock assessment data. See Table 6 for statistics concerning observer coverage in 1979.

The costs of placing observers aboard foreign vessels are billed to the foreign governments, but receipts are deposited in the general treasury and do not directly support the program. The program must, therefore, compete with other NMFS programs for available funds and personnel ceilings.

The issues of optimum observer coverage in each fishery, the role of the observer, especially with respect to compliance, the use of observers on U.S. vessels, and the source of funding must be resolved in the near future. A program evaluation, currently in progress, addresses these issues and recommendations will be forthcoming upon its completion.

During the first 2 years under FCMA, foreign compliance was good. In 1979, however, there were 12 major violations of foreign fishing regulations. Eleven of these violations occurred in U.S. FCZ waters off Alaska. All of these violations involved the harvesting of fish in amounts that were greatly in excess of the entries reported in the ships' logs. One violation included concealment of 11 mt. of halibut, a species expressly forbidden to foreign fishermen. The violations represented underlogging in amounts ranging from 25 percent to 60 percent of the total catch on board. Penalties for six of the violations included revocation or suspension of the vessels' permits, the first use of this type of sanction. Recommendations for substantial fines have been made in every case.

These violations indicate a formidable and repetitive effort at noncompliance with the FCMA and reflect a serious threat to the effective management of fisheries resources. In the past,

Table 6 Foreign fishing vessel observer program, 1979

	Ireland	Italy	Japan	Korea	Mexico	Poland	Romania	Spain	Taiwan	U.S.S.R.	Totals
Northeast											
Total Days Fished	18	946	1,469	—	1,566	63	7	2,431	—	341	6,841
Days Fished with Observers	18	287	295	—	450	59	—	428	—	50	1,587
% of Fishing Days Covered	100.0	30.3	20.1	—	28.7	93.7	—	17.6	—	14.7	23.2
Southeast											
Total Days Fished	—	—	2,645	—	—	—	—	—	—	—	2,645
Days Fished with Observers	—	—	558	—	—	—	—	—	—	—	558
% of Fishing Days Covered	—	—	21.1[1]	—	—	—	—	—	—	—	21.1
Northwest and Alaska											
Total Days Fished	—	—	33,886	3,884	546	1,820	—	—	204	7,983	48,323
Days Fished with Observers	—	—	5,449	482	59	347	—	—	—	1,910	8,247
% of Fishing Days Covered	—	—	16.1	12.4	10.8	19.7	—	—	—	24.0	17.1
Southwest											
Total Days Fished	—	—	24	—	—	—	—	—	—	—	24
Days Fished with Observers	—	—	24	—	—	—	—	—	—	—	24
% of Fishing Days Covered	—	—	100	—	—	—	—	—	—	—	100

[1]Includes tuna longline vessels only.

NMFS had depended primarily upon catch reports provided by foreign fishing vessels to measure compliance with quotas. The number of foreign vessels actively engaging in fishing activities has prohibited sufficient coverage by U.S. observers to enable us to rely upon our own estimates of the foreign catch. This, coupled with the increased rate of serious violations, has resulted in strong emphasis on inspections of the fish holds during routine enforcement boardings. We advocate the increased use of observers on board foreign fishing vessels as being the most effective and available means of controlling this problem.

In 1979, U.S. fishing vessels were regulated by provision of the FCMA under nine fishery management plans. We expect a rapid increase in domestic enforcement requirements within the next several years as additional fishery management plans are put in place and their provisions become operative. Enforcement of these provisions will require significant increases in manpower, and the use of state enforcement personnel has been explored as a means to resolve this manpower problem. A recent contract with the State of Massachusetts provides for a working partnership in enforcing several laws (including provisions of the FCMA) involving Federal-State resource management.

One major domestic violation of the FCMA occurred in the Northwest Atlantic Ocean area during the year. This violation involved the landing of approximately 24,000 pounds of yellowtail flounder in excess of the allowable quota and valued at $17,888. This violation resulted in the first permit suspension involving a domestic fisherman under the sanction provisions of the FCMA.

Two major legal decisions resulted from the U.S. District Court Order concerning salmon fishing in Puget Sound and off the coast of the State of Washington this year. On July 2, the U.S. Supreme Court upheld virtually all of the "Boldt Decision" on Indian fishing rights, and on December 4, the Washington State Supreme Court reversed its earlier ruling and gave the Washington Department of Fisheries authority to allocate the salmon harvest among all user groups consistent with the U.S. Supreme Court decision. The U.S. District Court denied the U.S. Attorney's motion to dismiss most of the pending contempt of court cases and plans for handling the 270 pending cases in early 1980 were underway as the year ended. Frustrations of previous seasons were much the same, for both the fishermen and enforcement personnel; however, a tacit acceptance of the situation by most fishermen was apparent. This acceptance, combined with a smaller stock of fish, resulted in a dramatic reduction in the number of violations of Judge Boldt's court order during the 1979 salmon season.

A significant part of NMFS' enforcement resources is used to enforce Federal statutes other than fishery laws. The Marine Mammal Protection Act and the Endangered Species Act prohibit, among other things, the killing, capturing, harassing, and importing of certain marine mammals, reptiles, fish, and other living things. These Acts also restrict commerce in parts and products of these creatures. Instances of unlawful importation and interstate sale of such items as whale oil and etched whale teeth account for most investigative work under these two laws.

During 1979, a special enforcement effort to provide additional protection to the humpback whales which calve and breed in Hawaiian waters was implemented by NMFS Special Agents. Also during this year, a Task Force including NMFS, the Fish and Wildlife Service, and the U.S. Customs Service was established, by informal agreement at the Justice Department in Washington, D.C., to investigate the illegal importation of sea turtle meat. Responsibility for the interagency investigation was delegated to the Southeast Law Enforcement Division of NMFS.

Other laws which required a significant expenditure of enforcement resources are the Lacey Act and the Black Bass Act, which prohibit the importation and interstate trafficking in fish and wildlife taken in violation of State and foreign laws, and the Northern Pacific Halibut Act, which is concerned with activities of Canadian and United States commercial halibut fishing vessels.

International aspects

The International Fisheries Affairs Office of NMFS coordinates the Agency's participation in international activities concerning living marine resources of interest to the United States. In conjunction with the Department of State, the Office conducts negotiations with various foreign governments on fishery matters of concern to the United States.

NMFS also coordinates the activities for two Regional Fisheries Attaches, one in Tokyo, Japan, and one in Mexico City, Mexico. The Attaches follow major developments in world fisheries as they affect U.S. Government policies and programs, as well as the U.S. fishing industry.

The United States is party to several international fishery commissions, and NMFS provides support for the U.S. Commissioners to these commissions. NMFS also provides support for bilateral fishery claims boards and is responsible for a translation program for NOAA areas of responsibility.

Fisheries claims boards

To provide an informal but effective means of facilitating the settlement of claims advanced by a national of one country against a national of another country stemming from damage to fishing vessels or fishing gear, and to prevent conflicts between vessels of both countries carrying out fishing operations in the same areas, the United States of America and the Governments of Poland, Spain, and the U.S.S.R. have established fisheries claims boards. Although no recommendations for compensation were made during 1979, the U.S.-U.S.S.R. Fisheries Claims Board met on several occasions to discuss four claims which were outstanding. The American-Spanish Fisheries Board met to consider a claim which is still under consideration. Since no claims were filed with the American-Polish Fisheries Board, this board did not meet during 1979.

International organizations and negotiations

Efforts continued in 1979 to adapt U.S. involvement in international fisheries activities to the new concepts of extended fisheries jurisdiction that have been implemented by the United States and many other countries. Particular interest was focused on negotiating or renegotiating international fishery agreements that would address U.S. interest in marine resources that range beyond the U.S. 200-mile fishery zone and can be affected by the actions of other countries. Frequent interaction between United States and foreign officials was also required regarding the participation of other countries in fisheries under the jurisdiction of the United States pursuant to the Fishery Conservation and Management Act of 1976 (FCMA).

Under the FCMA, countries desiring to fish in the U.S. FCZ must enter into governing international fishery agreements (GIFA's) with the United States, acknowledging exclusive U.S. fishery management authority in its zone. Although such countries thereby become eligible for allocations, GIFA's do not guarantee a right to fish. Allocations are made only if U.S. fishermen will not utilize the entire optimum yield in a fishery during the fishing year.

In 1979, the United States concluded a GIFA with the Faroe Islands. Because Denmark is competent with respect to foreign affairs on behalf of the Faroe Islands, Denmark also signed the GIFA. Conclusion of the GIFA with the Faroe Islands and Denmark brought to 13 the number of GIFA's negotiated since enactment of the FCMA. Other GIFAs include those with Bulgaria, Cuba, the European Economic Community, the German Democratic Republic (East Germany), Japan, the Republic of Korea (South Korea), Mexico, Poland, Romania, Spain, Taiwan, and the U.S.S.R.

International North Pacific Fisheries Commission (INPFC)

The Protocol amending the International Convention for the High Seas Fisheries of the North Pacific Ocean was ratified by the United States on November 2, 1978. Following ratification by Canada, Japan, and the United States, the Protocol entered into force on February 15, 1979.

At the annual meeting of the INPFC in Tokyo, Japan, October 29-November 1, 1979, research of the three nations on fishery resources was reviewed in the Biology and Research Committee. New scientific research on Dall's porpoise taken incidentally when fishing for salmon was discussed by the new Ad Hoc Committee on Marine Mammals.

International Pacific Halibut Commission (IHPC)

On March 29, 1979, Canada and the United States reached agreement on the Protocol amending the Convention for the Preservation of the Halibut Fishery of the Northern Pacific Ocean and Bering Sea. The previous convention established a scientific staff and provided the mechanism for regulating the halibut fisheries of Canada and the United States. The 1979 Protocol continues the scientific research staff. While the Protocol maintains Commission regulation of the halibut fisheries, an Annex to the Protocol provides that Canadian fishermen will not be permitted to fish in the U.S. fishery conservation zone after March 31, 1981. During 1979, Canadian fishermen were allowed to fish specific amounts of halibut in all areas of the U.S. FCZ except the Bering Sea.

Convention for the establishment of the Inter-American Tropical Tuna Commission (IATTC)

Over a period of 2-1/2 years and continuing into 1979, officials from Costa Rica, Mexico, and the United States have held a series of negotiations to develop a new tuna conservation and management convention to replace the IATTC to which Costa Rica and Mexico no longer belong. Because of the inability to resolve the outstanding issues, efforts to achieve a long-term permanent agreement gave way in September 1979 to attempts to achieve 3-year interim arrangements before the beginning of 1980. Despite repeated attempts since September to reach an interim agreement, fundamental differences remained at the end of the year on several issues, including that of coastal State guaranteed annual allocations of yellowfin tuna.

At their annual meeting held October 22-23, 1979, in Panama City, Panama, the member governments of the IATTC delayed a decision on the total allowable yellowfin tuna quota for 1980 pending further developments in the negotiations to develop new management arrangements for the yellowfin tuna in the eastern tropical Pacific.

International Commission for the Conservation of Atlantic Tunas (ICCAT)

The International Commission for the Conservation of Atlantic Tunas was held in Madrid, Spain, November 14-20, 1979. Conservation measures adopted at the meeting include the continuation of the current regulation for bluefin tuna limiting fishing mortality to recent levels and the establishment of a minimum size limit of 3.2 kg. for bigeye tunas. The Commission also adopted a procedure whereby the Port Inspection Scheme agreed to at the 1978 meeting will be put in effect. Of particular interest was a proposal by France to

amend the Convention to allow accession by the European Economic Community. This matter will be discussed at the next year's meeting, and ultimately resolved by the party governments. On other matters, the Commission noted the commencement of its International Skipjack Year Program, a 4-year study which will focus on tagging, exploratory fishing and oceanographic surveys of Atlantic skipjack stocks. The major areas of interest are the West Coast of Africa, the Gulf of Mexico, and the Caribbean Sea.

North Pacific Fur Seal Commission (NPFSC)

The United States hosted the 22nd meeting of the Commission in April 1979, during which a subcommittee of the Standing Scientific Committee was established to review harvesting methods and to recommend to NPFSC the most humane harvesting methods available. The establishment of the subcommittee was proposed by the United States and unanimously supported by all delegations.

The primary work of the 22nd meeting was the consideration of the Report of the Standing Scientific Committee which detailed the research carried out by the party governments, the composition of the commerical harvest, and other activities of the parties relative to their obligations under the Interim Convention on Conservation of North Pacific Fur Seals. The United States harvested a total of 26,100 male fur seals between 2 and 5 years old in 1979 and permitted a subsistence take of 350 by the Aleut residents of the Pribilof Islands.

Also during 1979, NMFS published an environmental impact statement, conducted public hearings, and consulted with other governments regarding the future of the Interim Convention. Following this process, NOAA recommended to the Department of State that the Convention be extended for a period of 4 years, with slight modifications to accommodate the extended fishery jurisdiction of the party governments. This recommendation to extend the Convention was based on two primary considerations: (1) the need to protect this species in waters outside our fishery jurisdiction; and (2) our responsibility to the Aleut people who live on the Pribilof Islands.

Convention on Future Multilateral Cooperation in the Northwest Atlantic Fisheries

The Convention, which established the Northwest Atlantic Fisheries Organization (NAFO), entered into force on January 1, 1979. Parties to the Convention include Bulgaria, Canada, Cuba, the European Economic Community (EEC), the Faroe Islands (Denmark), the German Democratic Republic (East Germany), Iceland, Japan, Norway, Poland, Portugal, Romania, and the U.S.S.R. The Convention replaces the International Convention for the Northwest Atlantic Fisheries (ICNAF) which continued in force in 1979 as transitional arrangements were completed.

The NAFO is responsible for continuing multilateral scientific research and investigation of Northwest Atlantic fish stocks, and for managing stocks and allocating catches that occur beyond national fishery limits. In the case of overlapping stocks, NAFO is responsible for ensuring that management measures taken beyond national fishery limits by the contracting parties are consistent with those taken within such limits by the appropriate coastal State. The organization consists of the General Council, the Scientific Council, the Fisheries Commission, and the Secretariat and is headquartered in Dartmouth, Nova Scotia. The NAFO held its inaugural meeting in March 1979, in Montreal, and its first annual meeting in June 1979, in Halifax.

The United States withdrew from ICNAF on December 31, 1976, but participated actively in the negotiations that culminated in the NAFO Convention. President Carter transmitted the convention to the Senate on May 3, 1979, recommending early favorable consideration. Hearings are anticipated in 1980.

United States-Canada maritime boundary and fishery resources negotiations

On March 29, 1979, the United States and Canada signed several agreements related to fisheries and to the maritime boundary between the east coast of both countries. The comprehensive East Coast Fishery Resources Agreement would establish a United States-Canada East Coast Fisheries Commission and would provide for management, access, and sharing arrangements covering more than 30 stocks of interest to both countries. Agreements related to the east coast boundary would submit the delimitation issue to a Special Chamber of the International Court of Justice. In addition, both countries agreed to arrangements on the west coast enabling U.S. fishermen to continue operations for groundfish in the Canadian zone for 2 years while Canadian fishermen continue operations on a limited scale for halibut in the U.S. zone for a similar period.

These agreements represented the culmination of more than 2 years of intense negotiating activity. The East Coast Fishery Resources Agreement represents perhaps the most comprehensive fishery agreement ever undertaken by either country and would go far in resolving a number of major resource conservation and sharing problems faced by both countries as the result of extended fisheries jurisdiction. The Commission envisioned under the agreement would consist of seven representatives from each country. In addition, there would be two impartial cochairmen, one appointed by each country. The Agreement also provides for the appointment of an arbitrator who would decide issues that could not be resolved in the Commission or by the cochairmen.

Under the Agreement, stocks are divided into three management categories that provide for different levels of interaction between the countries in managing the stocks. The Agreement also sets forth management principles to guide both sides in developing management measures.

President Carter transmitted these agreements to the Senate on May 3, 1979, urging early favorable consideration. The House Subcommittee on Fisheries and Wildlife Conservation and the Environment of the Merchant Marine and Fisheries Committee held hearings on June 22, 1979. The Senate Committee on Foreign Relations is expected to hold hearings in early 1980.

North Atlantic salmon

In 1972, in response to concern over dramatic increases in the salmon harvest off West Greenland, the United States undertook an agreement with Denmark that provided for certain restraints. The International Commission for the Northwest Atlantic Fisheries (ICNAF) adopted those restraints as management measures later that year. Those measures continued in force under ICNAF, but expired at the end of 1979 when ICNAF was replaced by the Northwest Atlantic Fisheries Organization (NAFO). The NAFO Convention does not include salmon among the species covered.

In 1979, the United States held a series of discussions with concerned countries in an effort to develop a common approach toward the issue of Atlantic salmon protection. Efforts toward this end will continue in 1980.

United States-Canada pacific salmon interception negotiations

United States talks with Canada regarding Pacific salmon interceptions were interrupted in May 1979, following the tragic death of Donald L. McKernan, head of the U.S. delegation. Internal reviews were subsequently undertaken by both countries on the current status of the issues that arise when the fishermen of one country catch salmon that originate in the other country. Talks between the two countries on these matters were resumed in late 1979 with both sides reaffirming their interest in achieving an agreement that would facilitate the implementation of limits on Pacific salmon

interceptions, as well as the conservation and enhancement of the salmon resources of both countries. An active schedule of negotiations on these matters is planned in 1980.

Bilateral fishery consultations

Officials from the United States and Mexico met on May 3 in Mexico City to review the application and implementation of the United States-Mexico Fisheries Agreement. Under terms of the agreement which was implemented in 1976, U.S. vessels fished in 1979 in the Mexican Gulf waters for shrimp, snapper, and grouper and within 12 miles of the Pacific Baja Peninsula for tuna and market species. The terms related to the shrimp fishery terminated on December 31, 1979. Two meetings were held with Mexican officials during 1979 regarding an extension of the arrangements to permit U.S. shrimp vessels to continue their operations in Mexican waters. In the second of these two meetings, United States and Mexican scientists met December 6-7 in Mexico City to review the available data. The conclusions reached by the joint scientific group confirmed previous U.S. studies that indicated that the Tampico fishery appears capable of producing a potential yield in excess of the catch levels in recent years.

During 1979, consultations regarding the operation of foreign fishing vessels in the U.S. fishery conservation zone (FCZ) were held with representatives of a number of foreign governments, including those of Japan, Korea, Poland, Spain, and the Soviet Union. Along with written comments received during the comment period on NMFS regulations, these consultations have been valuable in addressing concerns of foreign fishermen operating under provisions of the FCMA and the foreign fishing regulations. Additionally, discussions took place with foreign governments and industry leaders on the possibility of improving access to foreign markets for U.S. fishing interests through modifications in tariff and nontariff barriers.

Analysis of trends in world fisheries

The analysis of political and economic trends in world fisheries is an important NMFS activity because of the extension of U.S. fishery jurisdiction and large U.S. deficits in fishery trade. Foreign fishing industries are studied to provide background for negotiations and to regulate foreign fishing in the U.S. 200-mile FCZ. Foreign developments must also be studied to determine their possible impact on the U.S. fishing industry and U.S. Government policies and programs.

Current information on major developments in world fisheries was collected and evaluated, and NMFS received and used data prepared by over 240 U.S. diplomatic posts and two Regional Fishery Attaches.1/ Over 4,000 cables, dealing with fisheries and related subjects, were received, processed, and analyzed during 1979. In addition, NMFS and foreign fishery ministries and agencies exchanged about 1,000 publications, many in foreign languages.

Developments in world fisheries were followed closely when they could or did affect the fortunes of the U.S. domestic industry, or the policies of the U.S. Government. A total of 176 reports on foreign fisheries describing economic, marketing, technological, and political trends were prepared. The most important developments were summarized in a biweekly report. Detailed reports were prepared on the fisheries of Belgium, Canada, Mexico, and Peru.

Fishery reporting requirements of the Department of State were revised, and appraisals prepared of cables received from U.S. diplomatic posts. The Department of State has agreed to prepare several additional annual reports on foreign fisheries, including Argentina, Australia,

[1]The U.S. Department of State abolished two Regional Fishery Attache posts (in Copenhagen and Casablanca) in October 1978.

Indonesia, Korea, Nigeria, Peru, and Senegal. State Department and NMFS reports on over 50 countries have been made available to the public through the National Technical Information Service.

Foreign marketing services

During 1979, the U.S. fishing industry greatly increased its demand for information on fishery markets abroad. Priority was given to those U.S. companies and individuals who sought to take advantage of the opportunities created by the new U.S. 200-mile FCZ and the extended fishery jurisdiction of other countries. The U.S. fishing industry's hope to harvest the underused species of fish and shellfish available in U.S. waters is closely connected to the expectation that continued, comprehensive, and thorough analysis of trends in foreign fisheries will highlight opportunities not only for increased exports of edible fishery products, but also opportunities for U.S. investments and/or sales of U.S.-made fishing vessels, gear, and processing equipment.

A total of 126 fishery export opportunities (FEO's) were disseminated to the industry. The program, started in 1977 (when only 40 FEO's were published), was given increased emphasis in 1979 as the U.S. fishery exporters became more active and more numerous.

Detailed files were maintained on foreign fishery markets and fishing industries, and the information was used to prepare almost 700 replies sent to U.S. companies requesting specific marketing assistance. An even greater number of telephone queries was serviced, and the information from these files was made available to Federal and State Government agencies, industry, and the academic community.

A study of the fishing industry in over 30 African countries was disseminated to the U.S. industry. About 15 similar reports for Middle Eastern countries are being prepared and will be combined into one single report to be published in 1980. The reports are useful to existing and potential U.S. exporters of fishery products, gear, and equipment in studying foreign fishery markets for possible export sales.

Division of international fisheries development and services

The Agency for International Development (AID) supplies funds to NMFS to administer a training program for foreign nationals. Students are proposed by AID country missions or are referred by FAO. Twenty-six foreign students from 14 countries attended graduate schools in this country under the program. Nine of these students received advanced degrees during the year from Auburn University and the University of Rhode Island. These students came from Jamaica, Nepal, the Philippines, Thailand, and the People's Democratic Republic of Yemen.

Training was provided to foreign biologists in the 5-month Aquaculture Training Program at Auburn University. The participants were from Guyana, Jamaica, and Sierra Leone.

A Freshwater Prawn Farming Workshop was conducted for three students from Fiji by the Anuenue Fisheries Research Center, Honolulu, Hawaii, and was sponsored by FAO.

It is expected that another 31 students will arrive during 1980.
A seminar on U.S. fisheries was conducted in Washington and in NMFS field installations for senior African officials from Benin, Chad, Congo, Guinea, Guinea-Bissau, Senegal, the Sudan, and Togo.

Coordination with the AID

NMFS provides three fisheries scientists to AID as advisors in fisheries matters and to provide the technical expertise of the AID Fisheries Division. During 1979, the Division provided technical support to AID missions and host countries overseas by supplying expertise in the planning, design, and evaluation of projects in Djibouti, Egypt, Indonesia, Jamaica, Panama, the Philippines, and Thailand. Assistance was provided to regional bureaus and country missions in Washington through participation in project reviews and in other ways. The Africa Bureau was assisted in planning a Regional Fisheries Training center in the Sahel Region of Western Africa.
During 1979, the Fisheries Division administered seven AID-funded research and related projects. The Oceanic Institute in Hawaii conducted research on the artificial propagation of milkfish. Funds were provided again to Auburn University and the University of Rhode Island to develop expertise of freshwater and marine fisheries for country missions and host countries. Grants were made to (1) the Southeast Asian Fisheries Development Center (SEAFDEC), in Bangkok, Thailand, to fund a study of its structure and functions; (2) the International center for Living Aquatic Resources Management (ICLARM), in Manila, Philippines, to support its core program of research on fisheries in the lesser developed countries; and (3) the National Academy of Sciences' Ocean Policy Committee for a study of marine technical assistance and cooperation in fisheries and oceanography.
As a followup to the planning study conducted under contract last year on Collaborative Research Capabilities of U.S. Academic Institutions and Needs of the Developing Countries, the Fisheries Division assisted the Board for International Food and Agriculture Development and its Joint Research Committee in the detailed planning for collaborative research projects on aquaculture pond dynamics, tropical small-scale fisheries stock assessment, and post-harvest food loss reduction. For stock assessment, a workshop was held at the University of Rhode Island to define research topics appropriate for collaborative research. For post harvest losses, a preliminary meeting of leading research scientists in the field was held that resulted in a report recommending research topics.
During 1979, the Fisheries Division maintained contact with a number of national and international organizations and groups through meetings, workshops, and symposia. Official representation was provided to international fisheries meetings, such as the 13th Session of the FAO Committee on Fisheries, the U.S.-Japan Joint Committee on Natural Resources' Aquaculture Committee, and the African Leaders Program on Fisheries Management and Development Policy.

Translation service

The Language Services Branch (1) provides translations and translation information to all NOAA elements, Government and State agencies, industry, and academic circles; (2) examines and screens foreign publications in fields of interest to NOAA and arranges for their translations; (3) serves as a clearinghouse for translated literature in fisheries, oceanography, and other topics of interest to NOAA; (4) publishes four translation information publications; and (5) conducts an aquaculture translation program for all the U.S. Government agencies which have an interest in this area.
Over 2,600 translations were provided on a loan basis in 1979, including: 367 to NOAA, 903 to other U.S. Government agencies, 347 to U.S. universities, and over 1,000 to other establishments.

Material translated included 95 articles or books by contract and 2,400 pages of material (short manuscripts, articles, letters, and other documents) translated in-house. A total of 105 foreign reports, journals, and other publications were examined. Tables of contents were translated and the publications scanned for various uses, including translation of entire articles, summary translation for distribution, and to obtain information for reference purposes.

To keep users apprised of new foreign literature and translations and to provide additional sources of material, the NOAA translation program publishes the Translated Tables of Contents of Current Fishery and Oceanography Translations; the Survey of Foreign Fisheries Oceanographic, and Atmospheric Literature; and "Dailies", which contain current event information from foreign literature.

During the calendar year 1979, the following publications were issued: 6 Translated Tables, 10 Received or Planned Translations, 3 Surveys, and 17 "Dailies".

Some translations and printing are done in foreign countries where special foreign currencies (PL-480 counterpart funds) are available.

Eight U.S. Government agencies contributed $52,000 during FY 1979 for an aquaculture translation program. Approximately 30 aquaculture translations were completed in FY 1979.

Export expansion

The Division collaborated with the NMFS Office of Utilization and Development in the strong effort under way to increase U.S. exports of fishing products. A program was designed to provide current foreign fish prices from major European and Asian fishing centers. This information will be essential in the efforts of the U.S. fishing industry to expand its sales abroad. Advice on the design of the system was obtained from the U.S. industry and from State and Federal officials throughout the United States. The industry indicated a desire to see the program in place as soon as possible.

Division staff participated in trade fairs in Amsterdam and Paris to help introduce U.S. fish processors and exporters to market contacts in Europe. Staff also attended the second annual International Seafood Conference in Marbella, Spain. This provided an excellent forum for U.S. exporters to understand European requirements for seafood products.

Fishery allocations

The Division works with the State Department and with the NMFS Regions and the other headquarters offices in establishing and clearing allocations of the total allowable level of foreign fishing (TALFF). These activities are taking more time because releases from reserves (and variations in the U.S. fishing capacity) have become more frequent--more than six times in the Gulf of Alaska alone. Preliminary fishery management plans are being replaced by fishery management plans, and releases have frequently been made from several countries.

A large number of tabular reports have been issued relating to allocations. These include cross-sectional tables by species, country, fish plan, and fishing area, for initial and final allocations, and showing changes during the year. Special allocations and catch tables have been prepared on each country for briefing purposes.

A paper on factors to be considered in making foreign allocations was prepared.

Data collection

The Resource Statistics Division and the International Fisheries Development and Services Division are cooperating in archiving and presenting foreign fisheries data.

Archiving initial and final foreign allocations of TALFF, foreign catches, and prices in a time-series form was started during 1979. The

computer files included 832 items at the end of the year.
Catch and landing data from the Food and Agriculture Organization of the United Nations (FAO) are available in Division files as a computer printout, by country, species, and FAO area, from 1970 to date, in a time-series form. For each FAO area adjacent to the United States, the same data are available by species and country. For the last available year (1978), these data also can be presented in a 2-way table (species and area for a country and species and country for an area).
Fishery imports for a country, by product, are also available as a computer printout, presenting annual data in a time-series form from 1972 to date, and year-to-date for the current year and previous year. Fishery export data are available in the same table from 1978 to date. These foreign trade and FAO data are also available for any combination of countries (OECD, EC, GIFA, total,etc.).
Division staff also worked on foreign fees, and on foreign trade, as affected by the FCMA.

Antarctic program

Negotiations are nearing completion for a new convention on the conservation of marine living resources in Antarctica. Division staff participated in U.S. preparations for several negotiating sessions during 1979 as an integral part of the U.S. Interagency Task Force on Antarctica. Also, division staff represented NMFS/NOAA on the U.S. Delegation to the Tenth Consultative Meeting of the Antarctic Treaty Powers during September 17-October 15, 1979, and on the U.S. Delegation to three negotiating sessions concerning the marine living resources convention, as well as a preparatory meeting to discuss possible negotiations concerning a new minerals regime.
In addition to activity related to the international meeting, division staff assisted in preparations for an expanded NOAA role in Antarctica, with NMFS as the coordinating agency within NOAA.

Pacific island program

Division staff assumed a coordinating role for NMFS Pacific Island programs in 1979 for Hawaii, Guam, American Samoa, and the Northern Mariana Islands (NMI). This is in addition to the normal responsibilities relating to international fishery development in foreign jurisdictions of the Pacific, plus responsibilities relating to the Trust Territories of the Pacific Islands (TTPI), which are negotiating political status with the United States.
Activities included policy development for (and participation in) the Inter-Agency Task Force for the Micronesian Status Negotiations (for the TTPI), fishery meetings with representatives of the NMI, the Pacific Basin Development Conference, the Western Pacific Regional Fishery Management Council and the Pacific Tuna Development Foundation.

Caribbean programs

A new NMFS fisheries program for the Caribbean Sea and adjacent regions was developed in 1979, with division staff as active participants responsible for international development activities, including the FAO-sponsored Western Central Atlantic Fishery Commission (WECAFC) and the FAO/UNDP WECAF Project for development of 200-mile zones in the region. In addition, the division maintains liaison with officials working with the International Oceanographic Commission for the Caribbean and Adjacent Regions (IOCARIBE) to harmonize fishery-related projects in the region.
Under the NMFS Caribbean program, the division provides policy guidance and support for the Southeast Region, coordinates international activities with other regions, encourages the exchange with the United States of students, educators and administrators in the region, and provides support for international fishery development.

Food and Agriculture Organization of the United Nations

Division staff are responsible for NMFS FAO policy, including representing the agency on the Interagency Working Group on FAO, and on the U.S. Delegation to the Committee on Fisheries meeting and other special FAO meetings.

Southeast Region and Center

The Mexican Government approved applications allowing 23 snapper/grouper vessels and 95 shrimp vessels to fish in Mexico's 200-mile economic zone. In compliance with the United States-Mexico Bilateral Fisheries Agreement, shrimping by the U.S. fleet in Mexican waters is being phased out.

Scientists from both countries met in December to determine shrimp stocks which could possibly lead to continued access to the Mexican shrimp grounds by the U.S. fleet. However, on December 20, 1979, the Minister of the Mexican Department of Fisheries publicly stated that shrimping by the U.S. fleet after December 1, 1979, is not permitted.

Southwest Fisheries Center

At the Southwest Fisheries Center's La Jolla Laboratory, the Tuna/Billfish Resources Program continued research on the state of Atlantic tuna stocks. This research is in support of U.S. Advisors and Commissioners to the International Commission for the Conservation of Atlantic Tunas (ICCAT). These analyses identified critical fisheries management needs and provided scientific support for various management options.

Research results presented to ICCAT during the past year indicated that Atlantic albacore stocks are harvested at about the maximum sustainable yield, and that the probability of recruitment failure was low.

Research also indicated that yellowfin tuna stocks are heavily fished, particularly in the eastern Atlantic, where recent catch increases appear to be the result of offshore expansion of the fishery. Recent catches are within the range of estimated maximum sustainable yield. Any increases in equilibrium yield-per-recruit will depend on effective application of the 3.2 kg. minimum size limit and availability of large fish.

Northeast Region and Center

Northeast Region and Center staff have collaborated to prepare "A Short Run Economic Impact Analysis of the U.S.-Canadian Agreement on East Coast Fishery Resources." The economic study was provided to Congress as a supporting document for the Agreement in June 1979.

Since June 1978, reciprocal fishing has been discontinued for vessels of the United States and Canada in each other's undisputed waters. As a result, domestic vessels that formerly conducted traditional fisheries in Canadian waters have been forced to redirect their effort to the area of overlapping jurisdiction or waters clearly within the U.S. FCZ.

Foreign harvest in the Northwest Atlantic FCZ was reduced in 1979 relative to former years. A number of countries, notably those of Cuba and eastern Europe, have conducted only minor operations here, leaving a substantial amount of the surplus fisheries unharvested.

Fisheries were conducted in 1979 primarily by western European nations (Italy and Spain), Japan, and Mexico in pursuit of squids. The hake fisheries were largely underharvested.

Center personnel were involved significantly, including cochairmanship and coconvenorship, respectively, in the two meetings of the International Council for the Exploration of the Sea (ICES)--the Symposium on the Early Life History of Fish and the Workshop on Monitoring Biological Effects of Pollution of the Sea--held in the United States. At the annual meeting of ICES in Warsaw, Poland, Center personnel

contributed greatly with two series of scientific papers on estuarine quality and aquacultural genetics, and with papers on finfish and shellfish biology assessment.

As part of the United States-Japan Joint Panel on Aquaculture, Center personnel studied oyster mortalities in both countries, included Japanese aquacultural diseases in the ICES disease index, and added Japanese material to the Center's National Registry of Marine Pathology.

National Systematics Laboratory personnel contributed significantly, including co-convenorship, to the Workshop on Systematics of Fishes Living in Cold and Temperate Waters of the World Oceans. The workshop, part of the joint American-Soviet agreement on "Study of the World Ocean," was sponsored by NOAA and the National Science Foundation, and attracted 40 North American, 6 Soviet, and 2 Japanese scientists.

Northwest Region and Center

The Fisheries Data Management Systems Division made final estimates of the catch in 1977 of Bristol Bay sockeye salmon by the Japanese mothership salmon fishery. Estimated catch of maturing sockeye of Bristol Bay origin in 1977 (off year in the cycle of Bristol Bay runs) was 540,000 fish. In corresponding years of the Bristol Bay cycle (1958-59, 1962-64, 1967-69, 1972-74), the average annual catch of maturing Bristol Bay sockeye was about 682,000 fish. Estimated catch of age 2 immature sockeye of Bristol Bay origin in 1977 was 328,000 fish. During the prior 21-year period, 1956-76, the average annual catch of immature age 2 sockeye of Bristol Bay origin for nonpeak years was about 289,000 fish.

Resource assessment

NMFS conducts a multidisciplinary program of biological and socioeconomic research related to the protection and rational use of living marine resources for their aesthetic, economic, and recreational value to the Nation.

An important component of the NMFS research activity is the Marine Resources Monitoring, Assessment, and Prediction Program (MARMAP), whose mission is to assess continually the Nation's living marine resources. MARMAP has four components: (1) Resource Surveys uses NOAA ships plus chartered vessels to sample the abundance of fish and shellfish in their egg stage and in larval, juvenile, and adult stages by area and by season; (2) Fishery Engineering applies advanced technology to collect resources information and to ensure the rapid collection and processing of data; (3) Fishery Oceanography defines the influence of natural environmental factors on the distribution and abundance of living marine resources; and (4) Fishery Analysis takes the data from resource surveys, fishery oceanography, and commercial and recreational fisheries to construct yield curves and mathematical population models, and to make forecasts and status-of-stock reports to support management decisions and plans. Information from MARMAP also serves as a basis for international negotiations on fishery issues in cooperation with the Department of State.

In response to a NOAA evaluation of the MARMAP Program, plans were made to begin developing a MARMAP Operational Plan which will ensure efficient management of the MARMAP program. In addition, a special task force was set up to evaluate and recommend improvements in how NMFS performs fishery stock assessments.

MARMAP activities during 1979 are described below on a geographical basis.

MARMAP Northeast

Spring, summer, and fall bottom trawl surveys from Cape Sable, Nova Scotia, to Cape Fear, North Carolina, yielded MARMAP information and over 5,000 biological specimens and samples for studies by the Center and other research institutions. Assistance was given to the States of Maine, Massachusetts, and Rhode Island in developing supplementary inshore bottom trawl survey programs. Surveys were also conducted for sea scallops, surf clams, and ocean quahogs. Surf clam and ocean quahog surveys were improved by developing and testing (through diver and underwater television viewing for harvest efficiency, size selectivity, shell breakage, and bottom disruption) a new, state-of-the-art surf clam and ocean quahog dredge with a submersible electric pump. Procedures to gather pathological information at sea were also developed. Center personnel participated in joint surveys aboard East and West German, Soviet, and Canadian ships, as well as in 18 sea sampling trips aboard 16 commercial fishing vessels.

To develop an acceptable method for hydroacoustically surveying mid-water fishes, the Center was involved in the planning, funding, and reporting of the First International Symposium on Hydroacoustical Methods for the Estimation of Marine Fish Populations held at the Massachusetts Institute of Technology. Hydroacoustical research was also planned with Norway.

A third consecutive year of intensive plankton sampling involved six MARMAP surveys, providing 3,000 samples. The size of the adult population of yellowtail flounders was calculated for the occurrence of their eggs in these samples. Such samples also contributed to a description of larval hakes and sand lances, and to the preparation of an illustrated guide to larval fishes of the Northwest Atlantic.

A special program to survey the submarine canyons of the Northwest Atlantic with deep submergence research vessels continued, with the focus on the analysis of recent observations from Oceanographer Canyon. Information was developed on the species composition and diversity, depth distribution, and habitat preference of that canyon's megabenthic fauna. Burrowing behavior was seen as an important mechanism for food gathering and shelter procurement by these organisms, with the burrowing of red and jonah crabs, especially, eroding canyon walls in areas deposited with glacial clays.

The development of an image-scanning system for counting and measuring zooplankton progressed--preserved zooplankton can now be counted and measured 70-80 percent faster than before.

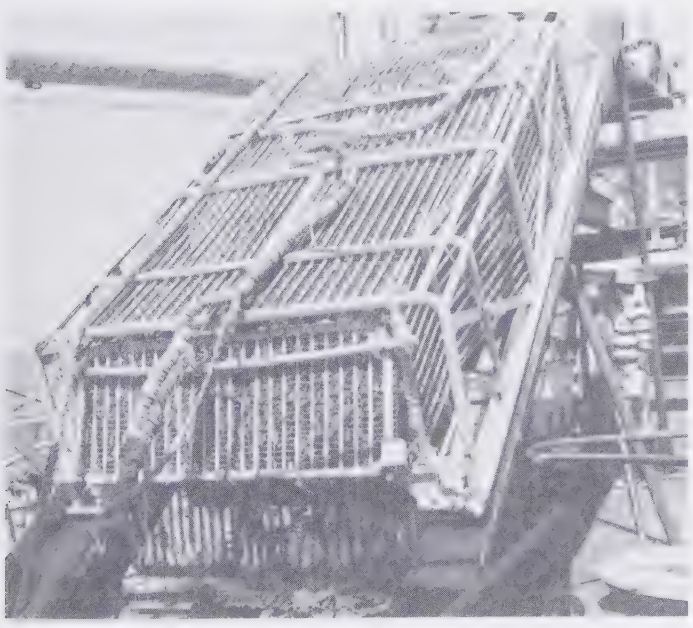
Lab work with ichthyoplankton included: (1) development of a model which relates feeding behavior to growth or starvation in larval Atlantic herring; (2) calculation of daily mortality rates during the critical first-feeding period of larval Atlantic herring, winter flounder, and summer flounder; and (3) development of techniques to determine biochemical indexes of larval food utilization and growth.

Food habits of demersal fish were studied through the stomach analysis of 17,000 specimens representing 16 species. A lab facility for studying digestion in juvenile and adult fish was established as well.

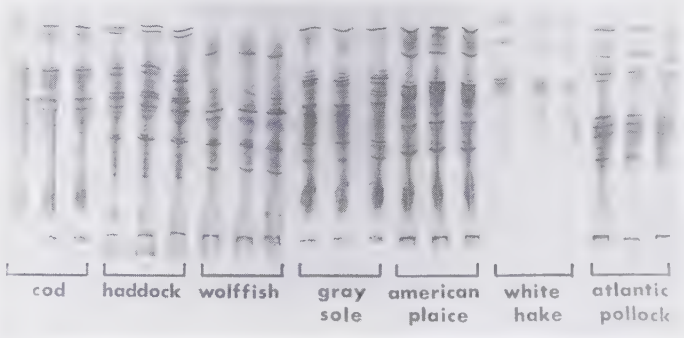
Research on sharks included stomach analyses of mako and blue sharks, development of histological techniques for aging mako and white sharks, and sonic tagging of mako, white, and blue sharks as well as swordfish.

Feeding behaviors of tilefish and juvenile bluefish were studied.

A report was prepared on the 18 species of Spanish mackerel, summarizing the primary diagnostic characters and distribution of each species, and including a key for distinguishing the seven American species. A method was developed for distinguishing different populations within a species by histochemical staining of enzymes separated by agarose gel isolectric focusing.



The Northeast Fisheries Center's Woods Hole and Gloucester Laboratories have developed this state-of-the-art hydraulic shellfish survey dredge. The dredge, incorporating an electrically-driven submersible pump, was designed by the Center's engineers with the best advice of the commercial fishing industry, and will be the basis for the assessment of the Northwest and Middle Atlantic's surf clam ocean quahog populations.



These sarcoplasmic protein patterns, or "biochemical fingerprints," of seven species of Northwest Atlantic fish, permit distinguishing between intermingled populations of the same species, or, determining the species content of processed seafoods. This "isoelectric focusing" technique, developed at the Northeast Fisheries Center's Gloucester Laboratory, is a rapid, precise, and reproducible method superior to conventional electrophoretic techniques.

Two new families of crabs were described, one from the shallow waters of the West Indies and another from the deepwater thermal vents of the eastern Galapagos Rift. Shrimp investigators have prepared a catalog of the 24 species of commercial and potentially commercial penaeoid shrimps from shallow waters of the American Pacific.

Processing continued for specimens, samples, and observations collected from commercial landings and MARMAP bottom trawl surveys. Species abundance indexes were updated and 60,000 finfish and shellfish age determinations of 11 species were completed. New aging techniques were developed for sea scallops and surf clams, and a study of an automated aging method for haddock was completed. A contract was awarded for the necessary computer software.

Stock assessments were performed for the following species (stocks): Atlantic cod (Gulf of Maine, Georges Bank/Southern New England/Middle Atlantic); haddock, redfish, silver hake (Gulf of Maine, Georges Bank, Southern New England/Middle Atlantic), and hake (Georges Bank, Southern New England/Middle Atlantic), pollock, yellowtail flounder (east of 69°W, west of 69°W) summer flounder, flounders except yellowtail and summer flounder, Atlantic herring (Maine juveniles, Gulf of Maine adults, Georges Bank adults), Atlantic mackerel, river herring, scup, weakfish, butterfish, bluefish, whitehake, skates, other finfish, squid (Illex, Loligo), total finfish and squid, American lobster, northern shrimp, deep-sea red crab, surf clam, ocean quahog, and sea scallops.

Preliminary results from current-meter studies in the Northeast Channel suggest twice as much flow of oceanic water into the Gulf of Maine as had been thought. Current meters have now been set across the continental shelf from Nantucket Shoals to the 800-meter depth to determine the along-shelf flow between the Middle Atlantic Bight and Georges Bank/Gulf of Maine region. Also, large annual variations have been found in the prevailing winds, and in the wind effects on the direction and magnitude of surface currents, for both the Atlantic and Gulf of Mexico continental shelf.

Satellite infrared imagery has shown large annual variations in the boundary between continental shelf and slope water masses off the northeast coast. Such imagery has also shown large annual variations in the formation rates, movements, and persistence of warm-core eddies originating from the Gulf Stream. Several years of temperature transects in the Northwest Atlantic have revealed marked annual differences in the temperature regime.

MARMAP Southeast

The NOAA vessel OREGON II participated in eight resource assessment cruises and one marine pollution cruise accounting for 199 days at sea. The cruises conducted related to the shrimp, reef fish, groundfish and habitat programs of the Center. Shrimp tagging cruises tagged and released a total of 23,084 white, pink, and brown shrimp off Louisiana, Mexico, and Texas. Reef fish cruises studied the abundance and distribution of deep water snapper, grouper, and tilefish off Puerto Rico, the Virgin Islands, the Yucatan, and the Gulf coast of Florida from Tampa to the Tortugas. Groundfish assessment activities were curtailed to a single fall resource assessment cruise. Catch data was obtained from a high-opening trawl versus a standard sampling trawl to establish distribution of groundfish in the water column for biomass estimates.

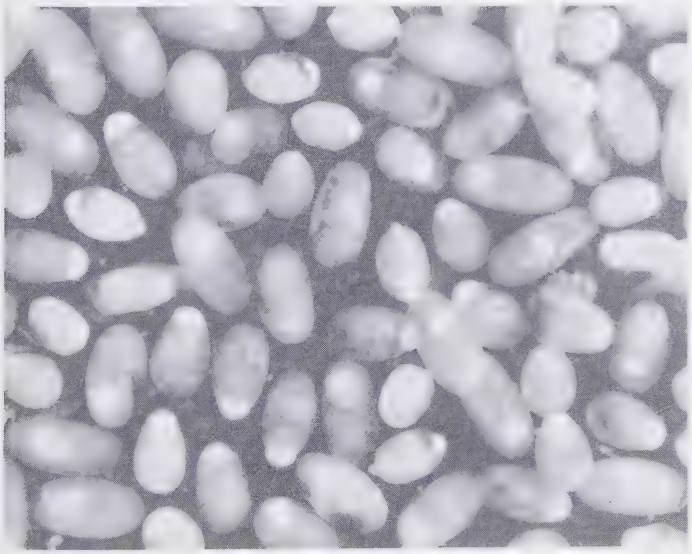
A fecundity study of the Gulf menhaden resource was conducted and MSY estimates were developed for the Atlantic and Gulf menhaden fisheries.

Consultations were conducted with Atlantic Environmental Group representatives to establish expendable bathythermograph transects in the Gulf of Mexico. Data from these transects will be combined with information received from Pacific Marine Environmental Laboratories on

modeling coastal circulation to merge the coastal model with an open ocean model for a complete interactive display of the Gulf of Mexico's circulation.
Development of technology to survey marine mammals and endangered species continued at the Center. The marine mammals transmitter was certified and live animal tests were conducted at the Sea Life Park, Hawaii. Location data points for the captive dolphin were computed from several passes of the Nimbus 6 satellite and were within 6 miles of the actual position. Turtles were fitted with radio transmitters for testing reliability of the system for tracking purposes, and the headstart turtle tracking experiment was conducted.

MARMAP Southwest

Scientists at the Southwest Fisheries Center's Tiburon Laboratory presented evidence to the State of California Water Resources Control Board that changes in water quality of the San Francisco Bay-Delta resulting from increasing human population and industry may have adversely affected fisheries resources. As one consequence of these findings, the California Water Resources Control Board established a resource project and delegated scientists to work co-operatively with physiologists and fishery biologists at the Tiburon Laboratory on the striped bass problem.
A dramatic illustration of how basic knowledge of fishes and their environment can be utilized in applied fishery science was demonstrated by the La Jolla Laboratory's Coastal Division in 1979. Beginning with the observation that time of ovulation in some fishes can be determined from follicular remnants in the ovary, scientists established that this was true in anchovies and could be used to determine spawning rates and weight specific egg production. This subsequently led to the idea that sampling of adult females in any 1 month during the spawning season, coupled with simultaneous collection of eggs, could, when treated statistically, be converted to estimates of anchovy spawning biomass. The model for the estimate is a simple function that relates the total production of eggs to the total tons of fish that had to be there to produce them. The advantages of this method over others that employ larval production as a tool for estimating biomass are: (1) the survey can be conducted over a brief period since it does not



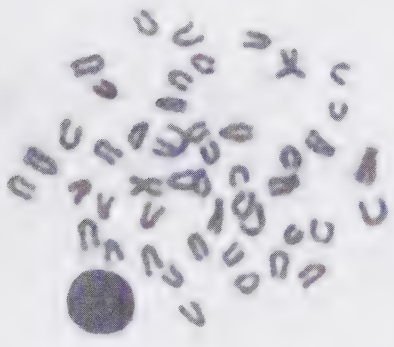
The oval eggs of the northern anchovy, *Engraulis mordax*, the most abundant fish in the California Current.

need to include the entire spawning period of the species; and (2) small nets can be used to capture eggs which greatly reduces the time and costs in analyzing the samples. Within the year, a full-scale field test of the idea was mounted by the Coastal Division. The results clearly showed that this technique can be used as a direct measure of anchovy biomass.

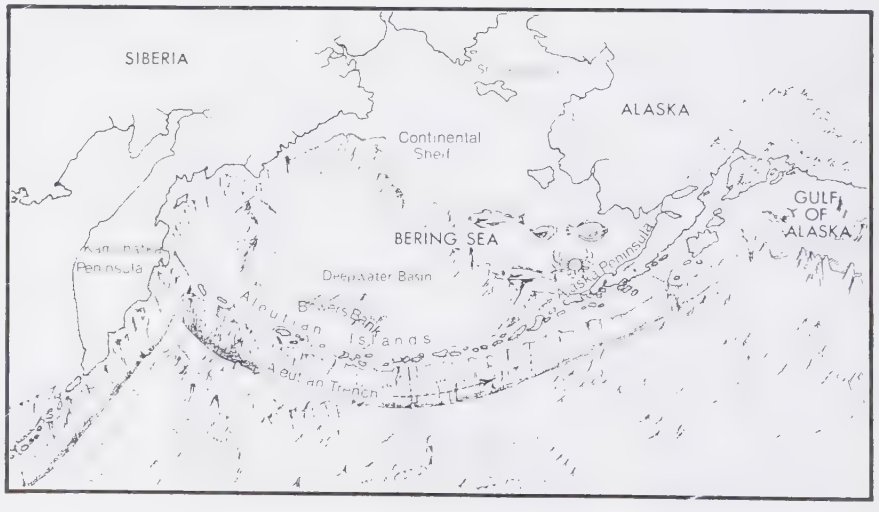
Comparisons of reproductive strategy of coastal fish species to geographical and seasonal features and characteristic flow pattern in the region of the California Current have yielded some striking similarities, according to scientists at the Pacific Environmental Group (PEG) in Monterey, California. The implication is that these flow features must have influenced reproductive success during the evolution of the strategy and thus are probably continuing to exert an influence on these fish species today. This work provides a mechanistic basis for explaining the correlation found by PEG staff between flow index series, which includes indexes of coastal upwelling and others reflecting wind-induced flow of the surface waters, and variations in such fish stocks as the coho salmon, rockfish, and dover and English sole.

Marine biologists and oceanographers from the Southwest Fisheries Center teamed with medical technicians aboard the NOAA research vessel JORDAN in August 1979, to make discoveries that help explain how the extraordinary physiology of the albacore tuna affects where and when the fish will be found. The commercially valuable albacore, or "white meat" tuna, like all tunas, has the unusual distinction of being "warm blooded," and the researchers believe that an understanding of the advantages and disadvantages of warm bloodedness will help scientists to predict the whereabouts of the fish and manage the resource more wisely. As part of the investigations, scientists performed a test to demonstrate that albacore have the ability to regulate body temperatures, studied blood chemistry of the fish, and isolated chromosomes for examination under the electron microscope to determine whether northern and southern albacore in the Pacific breed as one stock or two.

Medical scientists from the University of California, San Diego, working cooperatively with Center albacore fishery scientists, were successful in karyotyping albacore chromosomes from whole blood. Albacore were found to have 48 chromosomes. The albacore chromosome study is being conducted to evaluate if this method can be used to determine if there is more than a single breeding stock of albacore in the north Pacific.



Chromosomes of albacore tuna, *Thunnus alalunga*.



Bottom topography of the Bering Sea showing the eastern Bering Sea continental shelf and slope and deepwater basin surveyed in summer 1979.

MARMAP Northwest and Alaska

The most comprehensive survey ever carried out on the the groundfish and shellfish resources of the Bering Sea was completed by the Northwest and Alaska Fisheries Center (NWAFC) in the summer of 1979. The survey area encompassing 650,000 km2, extended from the Alaska Peninsula to St. Lawrence Island and from nearshore waters to depths of 750 m on the Continental slope. Three NWAFC research vessels occupied 596 stations with bottom trawls in the survey area and a vessel measured the off-bottom component of the large walleye pollock population using hydroacoustic and mid-water trawl methods. The survey was also a cooperative effort with the Fishery Agency of Japan which used two chartered commercial trawlers to sample 390 additional bottom trawl stations in the survey area. The Japanese covered much the same area as the NWAFC vessels, but extended their depths of sampling to 1000 m on the Continental slope; one of their vessels also surveyed hydroacoustically the substantial segment of the pollock population recently discovered in pelagic waters of the Bering Sea deepwater basin.

Besides its comprehensive nature, the survey also represented the first coordinated hydroacoustic and demersal trawl assessment of the pollock population over the Continental Shelf, slope, and deepwater basin. The resources on the Continental slope and in the region between St. Matthew and St. Lawrence Islands were also systematically surveyed for the first time.

Weights (and in most cases, numbers) of all groundfish and shellfish were determined at each trawl station, and large samples of biological data were collected. Approximately 228,000 fish were measured and almost 7,000 age structures collected on U.S. vessels to assess the current biological condition of the major stocks of fish. Collections aboard Japanese research vessels may have approximated the U.S. effort. Taxonomists from the Smithsonian Institute, the

The *Yakushi Maru*, a 164-foot Japanese landbased trawler chartered by the Fishery Agency of Japan for the 1979 Bering Sea survey.

Measuring walleye pollock from a demersal trawl catch during the 1979 Bering Sea survey.

California Academy of Sciences, and from universities in the U.S. and Japan also participated in the survey to catalog newly encountered species and to supplement their reference collections.

Abundance estimates and biological stock conditions derived from the 1979 survey will be compared with those obtained from prior surveys to assess stock changes for management purposes. The 1979 survey results will also be related to those from a comprehensive survey of the area in 1975 to examine long-term changes in the demersal fish community of the eastern Bering Sea. Some preliminary comparisons have indicated a substantially greater onshore distribution of some of the principal species in 1979 compared to 1975 which may be related to the approximately 4oC higher water temperatures observed in 1979 than in 1975.

In July 1979, a 44-day survey of fishery resources associated with seamounts in the Gulf of Alaska was completed aboard a 108′ charted crabber/trawler. This was the first effort by the United States to determine the kinds and quantities of marine life occurring on and above seamounts off Alaska. Extensive echo-soundings were made of nine seamounts coming nearest to the surface among the many that occur in the Gulf of Alaska to determine their bathymetric and topographical features. These nine seamounts rise precipitously from depths of 1000-2000 fathoms on the abyssal plain to within 90-400 fathoms of the ocean surface. The area on top of these seamounts ranges from approximately one square nautical mile (Applequist) to 70 square nautical miles (Surveyor) and averages about 24 square nautical miles.

Exploratory fishing successfully completed on all the seamounts except Applequist, using both midwater and bottom trawls, fish traps, and king crab pots, revealed extensive concentrations of sablefish (Anoplopoma fimbria) and deepwater red king crab (Lithodes couesi) on each seamount. Commonly caught species included the golden king crab (Lithodes aequispina), rattails (Coryphaenoides pectoralis, C. acrolepia and C. cinereus), numerous rare pelagic fish, and squid and juvenile salmon (primarily chums, Oncorhynchus keta).

Staff members continued supervisory participation in the Alaska Trollers Association Log Book Program. This cooperative program between the Trollers Association, Alaska Department of Fish and Game, and NMFS provides continuing seasonal information on environmental conditions and salmon, and marine mammal and demersal fish distribution movements and abundance in southeastern Alaska. Staff members also provided advisory assistance to the Washington State Trollers to establish a similar log book program.

PLANKTON WATCH, a program to monitor seasonal changes in the zooplankton species composition and abundance, was initiated in support of juvenile salmon studies of the NMFS and Alaska Department of Fish and Game. The objective of this program is to define the influence of the timing and seasonal abundance of zooplankton species on the survival of juvenile pink and chum salmon.

Chemical and physical oceanographic data gathered in support of juvenile marine fish and juvenile salmon studies were compiled and submitted to the National Oceanographic Data Center.

Data management and information systems

The Office of Information Systems, established in 1977, was redesignated the Data Management and Information Systems Division (an element of the Office of Science and Environment) with substantially the same mission of developing data management systems to serve national-level information needs and coordinating all data management planning and development activities in NMFS. The National Data Management Committee met in January, June, and October to coordinate

national and regional system development activities. The interactive computer system known as FISHNET (Fishery Information Network) continued to be the facility for capturing and exchanging fisheries law enforcement data. The network is also the facility through which other national-level information is processed. Current data systems pertain to NMFS budget formulation; marine mammals and endangered species management; fishery management plan process control; NMFS financial assistance programs; the cataloging of documents in support of the legal requirement that an administrative record be maintained for each fishery management plan; and the computation of costs of the U.S. foreign fishery observer program nationwide. FISHNET also contains a growing catalog (called a "data locator") of documentation pertaining to the socioeconomic aspects of fishery management. An analysis entitled DATALINK was initiated in mid year with the purpose of determining the optimum means of interchanging fisheries data among the regions and the headquarters in Washington, D.C. in 1983 and beyond. Particular attention will be given to the technique of computer-to-computer interlinking.

Development of the Northeast Regional Fisheries Information System continued with: (1) establishment of statistical committees as part of the NMFS State-Federal Program to ensure coordination of data management and information systems work between Federal and State agencies throughout the Northeast Region; (2) reorganization and formalization of the Center's data management and information systems throughout the Northeast Region; and (3) extension of the Northeast Regional Office's detailed collection of fisheries statistics in the New England States to include New Jersey.

The NWAFC achieved a major ADP upgrade primarily to support the needs of the Fishery Conservation and Management Act. At year's end, computers were in place in Juneau, Kodiak, and Seattle. The Juneau and Seattle computers have been linked through an arrangement for NMFS to share in the use of the Alaska Ferry System's leased data lines between Alaska and Seattle. A broadly integrated data base structure is in early stages of planning and applications currently being accomplished on outside computers are being rapidly converted to the Center's Burroughs computer system. This network will serve the fishing informational needs of two NMFS Regions, two Regional Fisheries Management Councils, the Central Office, and the analytical requirements of fishery and marine mammal scientists engaged in the Center's research activities at four geographically separate laboratories.

In the Southeast, work continued with the Technical Information Management Services (TIMS) operation of the Center to broaden the data base and the dissemination of information to our partners. Some of the important developments included a Regionwide Vessel Enumeration System Plan, an Atlantic States Vessel System, a Gulf Shrimp Computer System, and an Observers Program System.

The Southeast Center upgraded their ADP facilities with terminals, printers, and other ADP supporting equipment.

Resource statistics

The FCMA has increased requests for all types of data on fisheries. Thus the collection, compilation, storage, retrieval, dissemination, and management of fisheries data are being accelerated. All NMFS regions are developing information systems in order to be responsive to the needs for fisheries data by the Regional Fishery Management Councils and other users. NMFS continues to improve its fisheries data base to provide data at the local, state, and regional level for users in order to manage the fisheries rationally.

Fishery statistical programs of NMFS include: (1) marine recreational fisheries, (2) commercial marine and inland fisheries, and (3) fishery market news data.

The concerted effort to obtain a data base on recreational fisheries is continuing. The data base is needed to assure recreational users of marine resources equitable considerations in decisions by resource managers. The first year's recreational fisheries survey contract (November 1978-October 1979) included the Atlantic Coast, the Gulf Coast, the Caribbean area (Puerto Rico and the U.S. Virgin Islands), and the Western Pacific area (Hawaii, Guam, and American Samoa). This survey was extended for two months (November--December 1979). The second year's survey, covering calendar year 1980, includes the Atlantic and Gulf coasts and the Western Pacific area, now including the Northern Mariana Islands. A survey also was started in July 1979, on the Pacific coast (California, Oregon, and Washington) which will continue through June 1980. It is planned to extend the Pacific coast survey for 6 months, through December 1980. Thus, all geographic areas in the 1981 survey will cover the same time period, calendar year 1981. Several coastal states are participating in the intercept or creel surveys. Also, several agencies are providing the opportunity to collect additional information or to improve data reliability. These include the Gulf States Marine Fisheries Commission, the Western Pacific Fishery Management Council, the State of Maryland, the Mid-Atlantic Fishery Management Council, the State of Florida, and the Bureau of Land Management of the U.S. Department of Interior. The Pacific Coast intercept survey is being conducted by State agencies through the Pacific Marine Fisheries Commission.

The collection of commercial fishery statistics continued throughout 1979. Data were collected on domestic catch and landings; fresh, canned, and frozen processed fishery products and byproducts; number of fishing vessels by tonnage and length; number of fishermen and personnel on commercial vessels and employment in the processing industry; U.S. imports and exports of fishery products; exvessel and wholesale prices; foreign catch in the U.S. conservation zone by country and species; U.S. supply of edible and industrial fishery products; and disposition of the domestic catch.

Effort to obtain the cooperation of the States in collecting fishery statistics continues. Efforts to obtain more State cooperation in the collection of fishery statistics are progressing in the Northeast and Southeast regions. The Pacific States are the primary collectors of landings statistics.

Fishery Market News Reports are published three times a week at Boston, Mass., New York, N.Y., New Orleans, La., Terminal Island, Calif., and Seattle, Wash. The reports show fishery landings, receipts at major markets, exvessel and wholesale prices, cold storage holdings, and other real-time information of interest to fishing and allied industries. Since 1975, the reports have been sold by subscription. Fishery Market News Reports are the only fishing industry source for timely information on supplies of fishery products, markets, prices, and other trends and developments.

During 1979, an informal cooperative agreement was established between the Alaska Department of Fish and Game and this office for the purpose of collecting and publishing exvessel price data on all species of fish and shellfish in Alaska. The price data was collected and published beginning in July. This is the first current exvessel data collected and published by species for all areas and species of Alaska.

A fishery statistics plan was developed in the Southeast to meet the data needs of fishery management plans. A reef fish headboat survey was conducted and a contract was awarded to survey the Atlantic bluefin tuna sport fishery. A cooperative data collection agreement was developed with the Associated Marine Institute for collection of recreational data for the State of Florida. Southeast Fisheries Center personnel also participated in the collection of data and samples from the IXTOC I oil spill.

Marine mammals and endangered species

Passage of the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA) in the early 1970's resulted in NMFS establishing and implementing research and regulatory programs that would protect certain marine mammals and endangered species. The MMPA in 1972 imposed a moratorium on taking and importing marine mammals or their products, with exceptions, in the United States. The Act included persons subject to U.S. jurisdiction on the high seas. In 1976, the Fishery Conservation Management Act (FCMA) expanded U.S. control over marine mammals to include the 200-mile fishery conservation zone (FCZ).

The NMFS is responsible under the MMPA for all porpoises, seals, sea lions, and whales. The Act allows exceptions and waivers of the moratorium on taking and importing. Alaska natives may take marine mammals for subsistence, and the Act provides for management of marine mammals to be returned to individual states.

Permits may be issued for scientific research and public display and incidental catch of marine mammals by commercial fishermen.

An annual report to Congress on the administration of the Marine Mammal Protection Act is available from the NMFS Washington, D.C., office.

The NMFS is responsible (as a result of the ESA of 1973) for developing and maintaining conservation programs for fish, wildlife, and plant species of the marine environment. Threatened and endangered species under NMFS jurisdiction are blue, bowhead, fin, gray, humpback, right, sei, and sperm whales; Caribbean, Hawaiian, and Mediterranean monk seals; shortnose sturgeon; green, leatherback, hawksbill, loggerhead, Kemp's (Atlantic) ridley, and olive (Pacific) ridley sea turtles; and the totoaba (a sea trout fish). Jurisdiction of sea turtles is shared with the Department of the Interior. The ESA, with exceptions, prohibits taking, importing, or exporting endangered species and their parts or products.

Bowhead whale

The National Marine Fisheries Service announced the closing of the bowhead fishery for the year on October 12, 1979, when 12 whales had been landed and 27 struck by Alaskan natives in their subsistence hunt for bowhead whales. The International Whaling Commission (IWC) had set a quota for 1979 of 18 landed or 27 struck, whichever occurred first. Before 1977, the IWC did not regulate the native subsistence harvest of bowheads, although all other taking was prohibited. In response to a growing concern for the population of bowheads, the IWC removed the exemption for the native hunt and set a 1978 quota of 12 landed or 18 struck, later modified to 12 landed or 20 struck, whichever occurred first.

An Arctic cetacean program has been implemented at the Northwest and Alaska Fisheries Center to provide a more exact estimate of the western Arctic bowhead whale population size, recruitment and natural mortality rates, distribution and migration routes, and the effect of the Alaskan native harvest of these stocks. Information from this program is used to establish quotas for the native harvest. Based on observations made in spring 1978, the population of the stock of bowhead whales migrating past Alaska Eskimo whaling villages ranged from 1,783 to 2,865 whales, with 2,264 bowheads considered the best estimate. Extensive inshore ice hampered the 1979 effort to count whales migrating past Point Barrow by ice camp counting stations. Aerial surveys during the spring migration supported the previous observations that bowheads migrate exclusively in the nearshore lead.

Studies undertaken in 1979 included a March cruise aboard the icebreaker POLAR SEA; cruises aboard ships of opportunity in the Beaufort Sea

in the late summer; and a cruise aboard the Soviet vessel AVANGARD in the western Chukchi and Bering Seas in the fall. Results from these efforts provided more information on seasonal distribution and migratory patterns which suggested that breeding may begin as early as March. Cruise results indicate that in the fall a population of bowheads occurs in the Chukchi Seas south of the ice front.

International Whaling Commission

At the International Whaling Commission (IWC) annual meeting held in London, July 9-13, 1979, the U.S. delegation proposed a moratorium on all commercial whaling.

The IWC adopted a major part of that proposal by enacting a moratorium on factory-ship operations for all species except the minke whale. This decision eliminates Soviet commercial whaling in the North Pacific and substantially reduces Soviet and Japanese whaling in the southern ocean. Other accomplishments of the meeting included: the creation of a whale sanctuary in most of the Indian Ocean where commercial taking of any whale will be prohibited for 10 years; a 25 percent reduction worldwide in the number of whales that can be taken commercially and a 77 percent reduction in sperm whale quotas compared to last year; adoption of a resolution by member nations to refrain from buying whale products from nonmember nations; and establishment of an ongoing data processing capability.

The United States will continue to press for submission of adequate data from some of the whaling countries, for the implementation of a program that balances the needs of aboriginal peoples and the need to protect the whale stocks, for appropriate vigilance to cut down on pirate whaling operations, and for persuading other countries to join the IWC.

Incidental take of porpoise

The number of porpoises killed during purse seine fishing for tuna is now about five percent of the estimated 350,000 mortalities in 1972. Government actions, including regulations and research, encouragement from environmental groups and concerned citizens, and the cooperation of the tuna fishermen made this dramatic change possible. This was the second year of a 3-year management program that set quotas on the number of porpoises that could be taken by tuna fishermen.

The 3-year management program included regulations for large U.S. tuna purse seine vessels to install a porpoise apron before receiving a 1979 certificate to fish on tuna and to use specific release procedures on each set involving porpoise. The regulations provided a quota limiting the kill and take of porpoises by the U.S. fleet during purse seine operations and set requirements for an observer onboard each certified U.S. vessel for at least one trip per year. THe NMFS observers made 76 trips in 1979 aboard U.S. flag tuna vessels.

Members of the Inter-American Tropical Tuna Commission (IATTC) agreed this year to place observers onboard tuna purse-seine vessels belonging to Canada, Costa Rica, Mexico, Nicaragua, Panama, and the United States. Thirty-three of the IATTC cruises were made on U.S. vessels.

A film, "Tuna Seining and Porpoise Safety," completed by the Tuna/Porpoise Management Branch, Southwest Region, illustrates illustrates the fishing operation from start to finish, including the use of porpoise safety

gear and procedures designed to reduce the incidental mortality of porpoise. The film will be used to train tuna/porpoise observers, skippers, and crewmen.

Research efforts centered on understanding the more subtle causes of porpoise mortality by the tuna purse-seine fishery. A series of surface and underwater measurements were made in local waters of the Southwest Region in September 1979, to find solutions to mortality related to the backdown procedure used by the tuna purse seiners. Progress has been made in the development of a mathematical model of the behavior of the purse seine net which will allow investigation of various net designs to further reduce mortality.

The third aerial survey of porpoise populations involved in the tuna purse seine fishery was made during 1979. Two hundred eighty-eight porpoise herds were sighted. Fifty-eight of these sightings were identified as herds of the four primary species (spotted, spinner, common, and striped dolphins) involved in the fishery. Estimates of population abundance were made of the stocks surveyed and are included in the Report of the Status of Porpoise Stocks Workshop, August 27-31, 1979.

At the workshop, an international group of specialists in population dynamics met to reassess the status of the porpoise stocks involved. Past and recent research results on the reproductive biology, age structure, behavior, distribution, density and fishery-related and natural mortality rates of the dolphin stocks were reviewed.

The results of the review included new descriptions of the stocks and stock boundaries; the net reproductive rate was determined to range from zero percent to four percent; the stock sizes appear lower than previously estimated; the lower boundary of optimum sustainable population (OSP) was raised to 65-80 percent of the equilibrium unexploited population, and all stocks (except the northern offshore spotted, eastern spinner, and possibly whitebelly spinner dolphin) were found to be within OSP levels.

Marine mammals - commercial fisheries

A permit system established in 1974 allows the incidental taking of marine mammals by domestic fishermen during commercial fishing operations. The FCMA amended the MMPA to include the waters of the 200-mile fishery conservation zone. General permits have been issued to foreign fishermen, under the jurisdiction of the FCMA since 1977.

In 1979, five general permits were issued to domestic fishing associations and six to foreign countries (Japan-3, Poland-2, U.S.S.R.-1).

In January, NMFS held a workshop in Seattle, Washington, to discuss the status of stocks of species of marine mammals taken in the commercial fisheries and to evaluate the impact of incidental taking on stock levels. General permits and certificates of inclusion for 1980 will be based on the workshop report.

The Southwest Region and the Southwest Fisheries Center entered into a contract with the California Department of Fish and Game to survey and assess the involvement of marine mammals in established commercial and recreational fisheries in the State of California. The final report will provide the basis for development of the State-Federal marine mammal program if the State decides to apply for resumption of management authority.

Permits for public display and scientific research

The use of marine mammals for research and public display is controlled by permit, Letter of Agreement, or other specific authorization. A major objective of this system is to insure that the removal of animals from the wild will not adversely affect the populations or the ecosystems they inhabit. Permit applications are reviewed by the Marine Mammal Commission and the public. Notices of permit applications, issuances, and modifications appear in the Federal Register. This year, 63 applications were considered, 29 permits were issued, 24 Letters of Agreement were signed, and 30 modifications or amendments to permits were made. During this period, 229 permits with current valid authorizations for take or related activities required monitoring by the NMFS.

National Marine Mammal Laboratory

The National Marine Mammal Laboratory was established in Seattle, Washington, to provide a national focus in addressing marine mammal problems and to fulfill U.S. commitments under internatinal marine mammal agreements. The Laboratory is administered by the Northwest and Alaska Fisheries Center. Its five principal research programs are marine mammal-fishery interactions, endangered cetaceans-IWC, pinnipeds-other than fur seals, northern fur seals, and Arctic cetaceans.

The interactions between marine mammals and commercial fisheries are studied to evaluate the effect of marine mammal management programs on the environment and the impact of environmental changes on marine mammal populations. Two studies in progress are harbor seal/northern sea lion-fishery interactions on the Columbia River and the interaction of northern fur seals and fishery stocks in the Bering Sea.

The Marine Mammal Laboratory makes population studies of protected stocks of whales and exploited minke and sperm whales, especially in the North Pacific Ocean, to develop a data base for management recommendations to the IWC. Estimates of stock sizes of large whale species are developed through censuses, whale observation, marking cruises, and analysis of catch and effort statistics. The annual gray whale censuses off Monterey, California, and Umiak Island, Alaska; the cooperative killer whale survey in Puget Sound, Washington; and humpback whale surveys in southeastern Alaska, Hawaii, and Baja California are made under this program. The habitat needs of gray whales in their calving areas in Baja California; the possible use of radio tags to study whale migrations and distribution; and the effect of the incidental taking of Dall porpoise by the Japanese are being studied at the Laboratory.

In May 1978, a 3-year cooperative Japan-U.S. program was established by the International North Pacific Fisheries Commission to study the effects of the incidental take on marine mammal populations, particularly the Dall porpoise, by the Japanese high seas salmon driftnet fishery. The U.S. portion of the program focuses on the life history, food habits, distribution, abundance, and behavior of the Dall porpoise, and the interaction between marine mammals and the salmon fishery. Biological data and research samples are collected and marine mammal census surveys are made aboard Japanese salmon research vessels and U.S. vessels. This year the Japan Fisheries Agency made available a vessel for marine mammal and salmon research.

Pinnipeds - San Miguel Island, California

Six species of pinnipeds haul out on San Miguel Island, including the California sea lion, northern sea lion, northern fur seal, Guadalupe fur seal, harbor seal, and northern elephant seal. The Northwest and Alaska Fisheries Center has studied the population, biology, and behavior of these marine mammals since the discovery of a northern fur seal breeding colony at Adams Cove in 1968. The fur seal colony has grown each year, although the most dramatic increase has occurred since 1973. In 1977, 421 pups were born on the Adams Cove Rookery, and 635 pups were born in 1978. This growth represents the greatest single successive year increase in the pup population (50.8 percent) since studies of the colony began. In 1979, 834 pups were born, a 31 percent increase over 1978.

The number of fur seal pups born on Castle Rock, a small islet two miles north of the west end of San Miguel Island, has also increased from 95 in 1972, the year of its discovery, to 653 in 1979.

The California sea lion population appears to have stabilized with 7,000 to 8,000 pups born each year from 1975 to 1978 (about 20-percent increase from the early 1970's). The count of pups born in 1979 was 8,800. The more abundant California sea lions compete with northern fur seals for rookery space, because both species pup and breed at the same time at both Adams Cove and Castle Rock. Studies of interactions between the two species suggest that the less abundant northern fur seal is slowly displacing the California sea lion.

Northern fur seals and Pribilof Islands Program

The Fur Seal Act of 1966 charges the Secretary of Commerce with management of the northern fur seal and administration of the Pribilof Islands. The Act implements the Interim Convention on Conservation of North Pacific Fur Seals by providing for an annual seal harvest and for scientific research on the fur seal ecosystem. The Act further provides for the employment of Aleut residents in the harvest activity and for the social and economic needs of the Island communities.

In 1979, 25,762 fur seals were harvested on St. Paul Island. Commercial harvesting on St. George Island ended in 1973. St. George, through agreement of the governments party to the Interim Convention (Canada, Japan, the Union of Soviet Socialist Republics, and the United States), has been set aside as a research preserve so that the behavior and population dynamics of an unharvested population may be compared to the harvested fur seal population on St. Paul. The Interim Convention will expire in October 1980, unless the party governments agree to extend the terms of this treaty.

The transfer of most Federal land and buildings to the village corporations of St. George and St. Paul was completed on January 18, 1979. At this time, approximately three percent of the land on St. George and five percent of the land on St. Paul is Federally owned.

Federal involvement is gradually diminishing on the Pribilof Islands as the Aleut people assume greater responsibility for municipal functions. For example, in 1979 the community of St. George took over the operation of their grocery store and the city of St. Paul now manages the St. Paul Airport. The Aleut residents of the Pribilof Islands, in consultation with NMFS, are exploring new economic pursuits which will further decrease dependence on Federal programs.

Cetaceans

Gray whale

In 1978, the IWC removed the gray whale from protected status because the population had recovered to precommercial exploitation levels. An increasing number of people watch the gray whale's yearly migration along the Pacific coast which may cause potential problems of harassment of the whale. The Southwest Region has produced a brochure outlining proper whale watching techniques, minimum distance to be maintained between vessels and whales, and activities which may be interpreted as harassment.

Gray whales were counted during November and December 1978, as they migrated south out of the Bering Sea past Cape Sarichef, Unimak Pass, Alaska. An estimated 16,929 whales passed the Cape during the study period.

Annual shore censuses of southward migrating gray whales have been conducted for the past 12 years from points near Monterey, California. A series of studies were made during the 1978/79 southward migration to determine what proportion of whales pass out of sight of the shore observers. A preliminary application of the experimental results to the census data indicates a population of about 16,500 gray whales.

Humpback whale

Almost 60 percent (500) of the entire North Pacific population of the humpback whale winter in the coastal waters off the main islands of Hawaii where they mate and return to give birth to their young after a gestation period of about 12 months. These marine giants have been slow to recover from years of overexploitation; only five percent of their estimated original population exists today.

National Marine Fisheries Service published a Notice of Interpretation (NOI) of "taking by harassment" humpback whales in the Hawaiian Islands area in the Federal Register, January 4, 1979, to protect the humpback from a rapidly growing number of whale watchers. Portions of the NOI were summarized in a brochure distributed to private boaters, whale watchers, airlines serving Maui, and to the general public.

Bottlenose dolphin

The Southeast Fisheries Center awarded contracts to make aerial surveys of the bottlenose dolphin in three locations in Florida and Texas and to tag and assess the structure and life history of a local herd of dolphins off the Florida coast. These studies are being made to prevent this popular marine mammal from possible overexploitation. The bottlenose dolphin is frequently sought for public display permits.

Endangered species

The ESA Amendments of 1978 and 1979 placed greater responsibilities on Federal implementing agencies. Critical habitat must be declared at the time of original listing of a species (when appropriate); recovery teams must be formed; and public participation and review procedures have been added. Interagency cooperation and consultations have been strengthened, as called for under Section 7 of the ESA. Section 7 requires all Federal agencies to utilize their programs in furthering ESA; and to review their programs and assure that the actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of threatened or endangered species or result in the destruction or modification of their critical habitats.

The United States is a party to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) which controls the import, export, reexport, and introduction from the sea of Convention animals through a system of permits and enforcement. The new 1979 ESA amendments made the Department of the Interior, through the Fish and Wildlife Service (FWS), the management authority and the scientific authority (two groups that are required by CITES). An independent advisory commission to the scientific authority, the International Convention Advisory Commission (ICAC), includes a representative from NOAA.

Hawaiian monk seal

The Hawaiian monk seal was declared depleted in July 1976, under the MMPA and listed as endangered under the ESA in November 1976. The Marine Mammal Commission recommended in December 1976, that a portion of the Hawaiian monk seal's range be considered for designation as critical habitat. At this time, NMFS is preparing a draft environmental impact statement that will evaluate critical habitat alternatives for the monk seal. A recovery team for the Hawaiian monk seal will be operating by mid 1980.

A long-term cooperative study of Hawaiian monk seal biology was started in 1976 by biologists at the National Marine Mammal Laboratory, the National Bird and Mammal Laboratory (FSW), and Marine Mammal Commission contract researchers. Surveys were made of the status and trends of the population, and a population and behavioral study was made at Laysan Island in 1977, 1978, and 1979. Recent censuses indicate most island populations have declined and total counts have decreased, on the average, 50 percent since the late 1950's. Monk seal populations at Kure, Midway, Pearl, and Hermes Reef have declined 70 to 90 percent in the same period. Lisianski and Laysan Island populations have declined 40 to 60 percent. Monk seal populations at French Frigate Shoals and Necker Island have increased during the same period.

Sea turtles

National Marine Fisheries Service listed three additional species of sea turtles (loggerhead, green, and olive (Pacific) ridley) as threatened or endangered in 1978. Over 300 U.S. and international experts on sea turtles met at the World Conference on Sea Turtle Conservation in November 1979, at the State Department,

Washington, D.C., to discuss and appraise the plight of this marine species. The Conference adopted a Draft Conservation Strategy and Action Plan, which (among other issues) addressed the problem of incidental catch. Because sea turtles are caught incidentally in shrimp trawls, the Southeast Fisheries Center is developing an excluder panel for trawls that will reduce the incidental catch of the turtles. The recovery team established in 1978 has completed a major portion of its recovery plan for the turtles. The Cape Canaveral (Florida) Navigation Channel was closed to shrimp trawling under emergency regulations to protect hibernating sea turtles for a 120-day period ending March 22, 1979.

The Southeast Fishery Center has prepared reports on the progress of testing the sea turtle excluder trawl; marine turtle habitat surveys in the southeast, Puerto Rico, and the Virgin Islands; the rearing of Atlantic ridley sea turtles; a turtle survey of the Cape Canaveral Shrimp Channel; and the physiology of turtles in the Cape Canaveral Ship Channel. Contracts were awarded to plan a symposium on the scientific status of sea turtles of the western central Atlantic Ocean and to develop a methodology for conducting aerial surveys of turtles on and off nesting beaches of Florida, Georgia, and South Carolina.

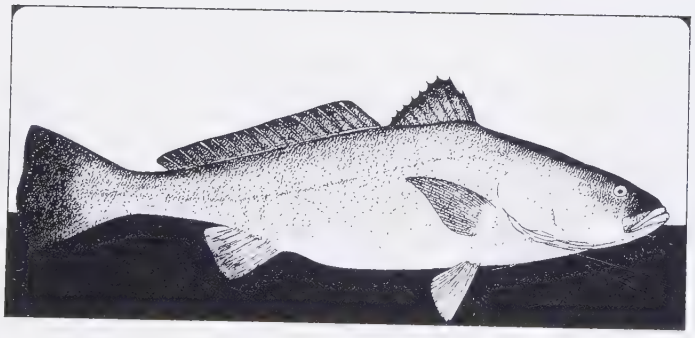
The discovery of dead sea turtles along the beaches of Cape Cod Bay, Massachusetts, late in 1978, led to the creation of a committee of Federal, State, and private biologists to evaluate these mortalities and prepare an emergency rescue plan for any future occurrences in the Northeast.

Shortnose sturgeon

A recovery team for the shortnose sturgeon is operating out of the Northeast Region. Recovery teams, made up of both government and private sector scientists, are responsible for producing plans that will help restore the stocks of threatened or endangered species.

Salmon and steelhead

The NMFS and the FWS continued an interagency review of the status of certain populations of salmon and steelhead in the Columbia Basin upstream from the confluence with the Snake River. The review will determine if any of these stocks should be proposed for listing as threatened or endangered, under the ESA.



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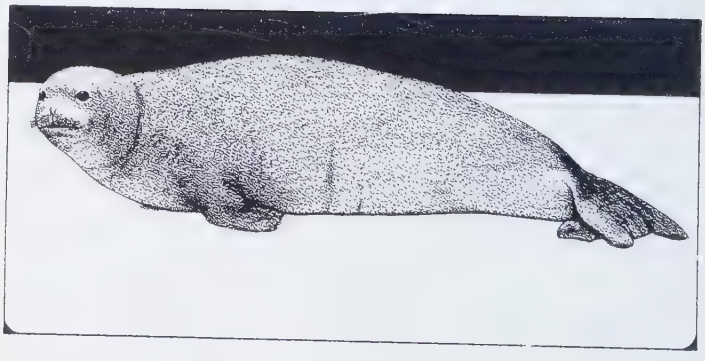


Hawaiian monk seal

Habitat protection

The Office of Habitat Protection continued its efforts in opposition to the siting of an oil refinery at Portsmouth, Virginia. Several detailed analyses and recommendations were completed by NMFS and furnished to decisionmakers, including the Chief of Engineers, Assistant Secretary of the Army, and the Secretary of the Army. These analyses and recommendations have documented NOAA's concern with siting a hazardous substance industry within the mouth of Chesapeake Bay, one of our Nation's largest and most productive estuaries.

NMFS has commented extensively on the Georges Bank lease sale which was held in December 1979. NMFS developed detailed analyses which primarily addressed the adverse effects to living marine resources and to their commercial harvest--which might result from oil and gas development on Georges Bank. Subsequent discussions between officials of the Department of Interior and NOAA resulted in the adoption of several important measures which will provide an additional degree of protection to the resources of Georges Bank as follows:

1. An Interagency Biological Task Force was formed to determine the effect of oil and gas activities on the biological resources of Georges Bank, and to recommend mitigation.

2. Deletion of some drilling areas from those offered at the sale.

3. Requirement of another environmental impact statement prior to actual production on Georges Bank.

4. Requirements for onsite pollution control equipment during both the exploration and development stages of oil and gas drilling.

NOAA/NMFS and the Northeast Regional Office of the National Marine Fisheries Service, has opposed issuance of an NPDES permit by the Environmental Protection Agency (EPA) to the Pittston Company of New York to site an oil refinery at Eastport, Maine. This opposition stems from predictable adverse impacts to living marine resources and their habitats in Cobscook and Passamaquoddy Bays, the Bay of Fundy and the Gulf of Maine due to petroleum spills. A NMFS biological opinion under Section 7 of the Endangered Species Act was issued on May 30, 1979, and indicated a lack of information to insure protection of endangered right and humpback whales. A NOAA task force was formed to present direct testimony and submit to cross explanation at an EPA adjudicatory hearing on all aspects of refinery impacts on marine living resources. A final decision is expected in July or August of 1980.

With respect to the Campeche Ixtoc oil well rupture, the NMFS initial interest focused on the Atlantic Ridley turtle, an endangered species, which would be impacted during its breeding cycle on the Mexican beaches. In early August 1979, it became apparent that the uncontained Mexico oil would soon reach U.S. waters. NMFS/NOAA, as members of a regional response team undertook an assessment of the vulnerability of the Texas coast. In addition, NMFS implemented plans to obtain shrimp and fish samples from landings in Texas ports for hydrocarbon analysis for comparison with those after the oil entered U.S. waters. NMFS also completed a contingency plan, which addressed the socioeconomic impacts of the oil loss on the fishing industry in the Gulf of Mexico. NMFS biologists assisted on scene in the protection of habitats and (in cooperation with State and local wildlife personnel) provided on-scene advisors for clean-up operations.

NMFS and the U.S. Fish and Wildlife Service have continued their joint efforts to promulgate regulations to interpret and implement the Fish and Wildlife Coordination Act (FWCA). These regulations define how fish and wildlife resources will be considered during planning and

construction of all Federally-constructed and approved projects affecting the waters of the United States. These regulations are to be signed jointly by the Secretaries of Commerce and Interior in response to the President's Water Policy Directive. During 1979, draft regulations were promulgated (Federal Register May 18, 1979) and a series of public hearings were held to obtain citizen and interest group input. Comments on the draft regulations were received from some 450 organizations and have been reviewed. Notification of an intent to publish an environmental impact statement was issued on November 6, 1979, followed by scoping meeting to determine the breadth of impact of these regulations. The Draft Environmental Impact Statement will be published in September 1980.

NMFS and the Office of Coastal Zone Management (OCZM) are concentrating on increasing fishery considerations in the CZM process. Efforts are being concentrated on State CZM programs at several stages: the development stage; the annual evaluation stage. In addition, we are encouraging increased predictability and more comprehensive decision making in existing programs through Special Area Managment Planning (SAMP). SAMP's are detailed land and water use plans for areas comprising a natural system, such as an estuary.

NMFS participated in NOAA's response to the National Ocean Pollution Research and Development and Monitoring Act of 1978 (Public Law 95-273). This Act designates NOAA as the lead Federal agency for preparing a comprehensive 5-year plan for a Federal program on ocean pollution research, development, and monitoring. The Act also requires that NOAA have a comprehensive, coordinated, and effective ocean pollution research, development, and monitoring program that is consistent with the 5-year plan.

A Federal Plan for fiscal years 1979-83 was prepared and submitted to Congress. Current efforts are directed to acquiring the information needed to update the plan in 1982 and produce a current catalogue of Federal ocean pollution research, development, and monitoring programs.

NMFS participated in a NOAA task force to provide analyses and recommendations on the NOAA marine-pollution related activities in response to the NOAA implementation of P.L. 95-273 (Section 5). The results of the task force's findings were released in August 1979.

The Office of Habitat Protection has been working with the NMFS Research Centers to develop a plan for habitat investigations and marine pollution research. The plan will present the scope and principal scientific elements of NMFS research in this area. The plan will allow for more efficient utilization and management of NMFS resources and facilities in this NOAA program area.

The Office of Habitat Protection is coordinating with the NMFS Northwest Region, Environmental Protection Agency (EPA), the Fish and Wildlife Service (FWS), and the Department of Agriculture (AGR) in meeting the requirements for registration of Squoxin (Squoxin is the brand name of a piscicide which affects only squawfish).

NMFS is developing, in conjunction with other elements of NOAA (Research and Development, Ocean and Atmospheric Sciences), an integrated marine pollution monitoring program for the coastal waters of the Northeast United States. The NMFS component of this program is called Ocean Pulse, which is an attempt to develop new methods for biological effects monitoring.

NMFS is participating in the preparation of an environmental impact statement (EIS) on deep seabed mining of manganese nodules. The goal is to review, interpret, and synthesize NOAA's deep ocean mining environmental studies (DOMES) into a programmatic EIS in anticipation of passage of interim domestic deep seabed mining legislation.

Regional activities

In the Northeast Region, NMFS was involved in the following activities during 1979:

- Center personnel: (1) provided information to the Northeast Regional Office Environmental Assessment Branch and NOAA Coastal Zone Management Office on potential impacts of oil drilling on Georges Bank; (2) prepared testimony on potential impacts of the proposed oil refinery at Eastport, Maine; (3) reviewed reports by the Consolidated Edison Company of New York, Inc., in connection with permit applications to the Federal Energy Regulatory Commission; and (4) reviewed research proposals for evaluating the effects of waste brine disposal from the Bryan Mound salt dome near Freeport, Texas.

- NMFS reviewed Connecticut, Delaware, Maryland, New Hampshire, New Jersey, and New York State CZM program documents, and has attempted to integrate State gishery input into State CZM Programs. NMFS has actively promoted the Coastal Fisheries Assistance Program. In addition, a staff member has served as Chairman of the Maryland State CZM Task Force of Living Aquatic Resources.

- Risks associated with oil and gas development on Georges Bank were defined in comments on Lease Sale No. 42. Various aspects of designating the area as a marine sanctuary also were addressed, especially from the standpoint of developmental activities and safeguards to be employed to protect living marine resources and associated fisheries.

- During the past year, in the Southeast Region, NMFS reviewed 6,387 applications for permits to perform work in navigable waters, 76 environmental impact statements, 113 Federal water development projects, and 1,388 permit applications for discharge of various pollutants into U.S. waters under the Environmental Protection Agency's National Pollutant Discharge Elimination System Program.

- Reviewed and commented on nine draft documents concerning Coastal Zone Management plans being developed by coastal states, Puerto Rico, and the Virgin Islands.

The Southwest Regional Environmental Assessment Branch (EAB) staff participated during the development of Port Master Plans for San Diego, Los Angeles, Long Beach, and Port Hueneme, and coordinated regional input of management and development fishery responsibilities. Staff members are currently developing overall packages of mitigation/compensation for projects planned in each port.

- A position has been established to concentrate on California water policy matters and to ensure that greater emphasis will be placed on anadromous resources and major water development projects.

- NMFS developed a regional policy concerning a proposal to construct a peripheral canal around the San Joaquin-Sacramento Delta. The policy was finalized in February 1980.

- NMFS provided representation on the Pacific Outer Continental Shelf Regional Technical Working Group to assure greater input of agency concerns in the OCS leasing process.

- NMFS represented the Region on the 301(h) Environmental Protection Agency/NOAA Task Group to review secondary treatment waivers for municipal discharges in the Southwest.

- NMFS developed a Regional NMFS/Office of Coastal Zone Management Plan of Coordination to enhance interagency participation in the coastal planning process.

- NMFS has been involved in the planning process regarding the experimental creation of a salt marsh on existing upland habitat in San Diego Bay. The project is unique in that it is the first attempt in the southern California area.

- NMFS provided detailed analyses of feasibility reports and accompanying draft environmental impact statements (EIS) for the following major projects: reauthorization of the San Luis Unit, the Central Valley Project, construction of an agricultural waste-water drain into San Francisco Bay, and the deepening of the Sacramento Deepwater Ship Channel.

- Some examples of the influence of permit review recommendations are:

1. NMFS recommendations (made as a result of permit reviews) resulted in restoration of over 100 acres of wetlands. The restoration projects compensated for damage to existing and potentially restorable fish habitat. The net result of the restoration work was a gain in habitat value and total wetland acreage, particularly in the San Francisco Bay area.

2. The California Department of Water Resources agreed to screen seven diversion structures in Suisun Marsh to prevent loss of juvenile anadromous fish. NMFS was the only agency to require the screening. Subsequent sampling has demonstrated that the vicinity of the diversions is heavily populated by vulnerable-sized fish.

3. Through Regional efforts, eelgrass transplanting has become a successful mitigation measure to offset impacts from projects which destroy existing eelgrass.

Activities of the Environmental Assessement Branch (EAB) Northwest Region for the year 1979 included the following:

- Reviewed 1,549 Federal permits, licenses, and projects during the year. The NMFS actively participated in interventions on six proposed Federal Energy Regulatory Commission (FERC) licenses, license modifications, and license renewals. For example, NMFS played a major role in preparing data and providing staff support in FERC relicensing negotiations with mid-Columbia Public Utility Districts and other fishery agencies. This effort culminated in three separate agreements with provisions for studies which will generate information regarding requirements for fish protection throughout the mid-Columbia. NMFS personnel also participated in monitoring study efforts during the 1979 outmigration of salmon through the mid-Columbia River system.

- NMFS provided policy direction and recommendations on state coastal zone management programs to insure inclusion of long-term aquatic resource protection.

- NMFS reviewed and commented on Tillanook Bay, Bay City, Astoria, and the Lower Columbia River Estuary comprehensive land use plans. Comments were provided on request during Land Conservation and Development Commission hearings on the Astoria and Bay City Comprehensive Plan.

-In addition, NMFS has participated in the development of Grays Harbor, Coos Bay, Yaquina Bay, and Columbia River estuary planning efforts. NMFS has also continued participation in the Snohomish Basin level B planning efforts.

- NMFS continued to represent OCZM on the South Slough Estuarine Sanctuary Management Commission.

- NMFS developed a regional plan for CZM/NMFS interaction incorporating permit and CZM processes.

- Completion of streamflow and riparian habitat data was completed for the Eastern Oregon Habitat Restoration Project in which NMFS has played a major role. The study includes the Deschutes, Umatilla, John Day, and Grande Ronde Rivers. Computer analysis and development of riparian rehabilitation plans are underway.

- NMFS personnel also participated with the Fish and Wildlife Service in preparation of a Fish

and Wildlife Coordination Act report for the Corps of Engineers' proposed McNary Second Powerhouse.

The Alaska Region Environmental Assessment Division's (EAD) 1979 calendar year activities were concentrated in six areas: Outer Continental Shelf (OCS) oil and gas leasing and exploration, coastal zone management (CZM), mining, timber harvesting, follow-up studies, and review of permits and draft environmental impact statements (DEIS's).

Outer continental shelf (OCS) oil and gas leasing and exploration

NMFS continued to be heavily involved in OCS-related activities in Alaska. Significant accomplishments included completion of resource assessment reports for proposed OCS oil and gas lease sales No. 57 (Bering Sea-Norton Sound), No. 70 (St. George Basin), and No. 71 (Beaufort Sea). Recommendations for tract nominations also were developed for these proposed sale areas and for proposed oil and gas lease sale No. 60 (Cook Inlet - Shelikof Strait). NMFS provided extensive comments and recommendations on the DEIS's for the Federal/State Beaufort Sea oil and gas lease sale and sale No. 55 (Eastern Gulf of Alaska). Also, NMFS participated in a subcommittee of the biological task force for the purpose of developing alternative mitigating measures with respect to seasonal drilling restrictions in the Beaufort Sea lease area.

Coastal Zone Management (CZM)

NMFS participated in developing the Alaska Coastal Management Program (ACMP), which received NOAA approval in July 1979. The District Coastal Management Programs being developed under the ACMP for Juneau, Anchorage, Valdez,the Kenai Peninsula Borough, and the North Slope Borough were reviewed whenever possible. NMFS has open communication with these districts, and expects to become increasingly involved with the development of district plans. As a follow-up to the March 1979 NMFS/OCZM coordination meeting in Juneau, the Alaska Region developed a plan for handling CZM-related activities in Alaska and successfully concluded negotiations with the State of Alaska to obtain a professional-level person (under an Intergovernmental Personnel Act agreement) to assist NMFS with district CZM programs.

Mining

NMFS involvement with the proposed U.S. Borax (Rio Tinto Zinc) molybdenum mining operation in the Misty Fiords National Monument near Ketchikan, Alaska, continued and increased in 1979. The mining claim is reputed to be the second largest known deposit of molybdenum in the world. As presently proposed, this mine would produce up to 60,000 tons of ore per day for a period of at least 40 years. Since mining operations could present major problems to the area's anadromous, estuarine, and marine resources, NMFS issued a protest to the mineral patents to the Bureau of Land Management on December 7, 1979. Substantial effort is being expended in developing information related to the harmful effects of heavy metals and water quality upon resources under our perview.

Timber harvesting

Timber harvesting in the Tongass National Forest Service continued to require a major commitment of time through participation on U.S. Forest Service planning and interdisciplinary teams. A large amount of effort was spent reviewing environmental impact statements covering two 5-year harvesting periods in the Tongass National Forest. Input was also furnished to the Alaska Region of the U.S. Forest Service on its Regional Land Management Plan under the direction of the National Forest Management Act.

Follow-up studies

The Alaska Region's EAD follow-up program, which was activated in July 1979, began examining NMFS effectiveness in permit reviews, designing management-related environmental studies that will improve NMFS effectiveness, developing a computer tracking system for the permit files, and identifying internal procedures and communication pathways beneficial to the NMFS habitat protection effort. Data fields to be extracted during preliminary efforts to evaluate NMFS effectiveness were identified in combination with plans to implement a computer-housed filing system.

Four development categories were identified as needing follow-up environmental studies that could directly influence future NMFS responses: waste discharges from seafood processors, boat harbor developments, intertidal filling and development, and build-up of wood solids and other debris near log dumps. One proposed study will examine the effects of the removal of wood solids and bark debris from the subtidal areas adjacent to log transfer facilities in southeast Alaska. A second proposed study will examine the tidal circulation patterns and the environmental effects realized through the removal of an unpermitted, illegal intertidal fill in Port Valdez.

Logging-related research requires immediate attention, and EAD has supported the Auke Bay Laboratory's (ABL) research efforts, to the extent possible. EAD provided approximately 20 days of field assistance to ABL personnel in the conduct of their ongoing research addressing logging and its effects on the freshwater and estuarine aquatic ecosystems. In return, ABL personnel assisted the EAD follow-up program in examining a 7-year-old EAD study site in Rowan Bay, Kuiu Island, Southeast Alaska.

Review of permits and draft environmental impact statements

Review of Corps of Engineers' permits continued, and an improved relationship began developing between the Corps and resource agencies. Monthly meetings were initiated in Anchorage to identify permit problems and to enhance exchange of information between agencies: NMFS personnel participated in each of these meetings and accompanied many joint inspections of permit actions. In 1979, NMFS responded to 350 permit applications, reviewed 17 DEIS's, prepared three resources assessments on OCS lease areas, and completed 18 special studies.

Habitat investigations

Major efforts at the Northwest and Alaska Fishery Center are focused on understanding the nature and effects of pollution on the viability of marine organisms.

The effect of pollution on a marine organism is (in part) determined by the ability of the organism to avoid the polluted area. In laboratory experiments, juvenile English sole (Parophrys vetulus) did not avoid contaminated sediment at concentrations of oil up to 10,000 ppm (the carrying capacity of the sediment). Thus certain marine fish in oil polluted surroundings would be at risk to damage.

Studies on the nature and impact of pollution in Puget Sound demonstrated that Elliott Bay (Seattle) and Commencement Bay (Tacoma) had not only the highest levels of potentially toxic chemicals in sediment and animal tissues in the areas examined, but also had the highest incidence of fish and crustacean tissue abnormalities.

Polychlorinated biphenyls (PCB's) and polynuclear hydrocarbons were prominent in both areas, while the additional high concentrations of chlorinated hydrocarbons (such as polycholorinated butadienes) were found in Commencement Bay. The most important biological abnormalitities in both embayments were the high number of liver tumors in flatfish and hepatopancreatic lesions in crabs.

A study designed to evaluate the effects of the Amoco Cadiz oil spill showed that onsite field exposures of organisms together, with histological examinations and chemical analyses of tissues, is a fruitful approach for assessing the persistence and potential biological effects of petroleum spilled in the marine environments.

Research on the short and long-term effects of oil and oil components on arctic and subarctic fish and invertebrates continues to elucidate the numerous detrimental impacts petroleum hydrocarbons have on marine and freshwater environments. The sensitivities of 39 adult and juvenile subarctic Alaskan species of marine fish and invertebrates to water-soluble fractions of Cook Inlet crude oil and No. 2 fuel oil were determined. Although sensitivity generally increased from lower invertebrates to higher invertebrates, and from higher invertebrates to fish, sensitivity was better correlated to habitat. Oil spills in estuaries may have a potential for increasing salmon egg mortality in intertidal spawning areas such as those in Prince William Sound and Port Valdez. Coho and pink slmon eggs were found to be quite tolerant to short-term (4 day) oil exposures, but long-term (14 to 21 day) exposures were found to be very detrimental to survival.

In Prince William Sound, Alaska, a baseline grid of eight stations has been established for the oil tanker shipping lanes. Chemical analyses thus far showed that operations associated with the Trans-Alaska Pipeline have not produced significant increases in levels of hydrocarbons in littoral sediments, mussels, water, or bottomfish.

During the first year of the Cooperative Fishery Research Program between the Forestry Sciences Laboratory (USFWS) and Auke Bay Laboratory (NMFS), two watersheds which will be logged during 1981-86 were selected as study sites. Preliminary surveys of the freshwater and estuarine environs were made at both sites during spring and fall and recording thermographs were installed (ABL) and a small research building eracted (USFWS) at one site. Preliminary analyses indicate a total production of about 1,000 adult coho salmon from Porcupine Creek with a commercial fishery exploitation of about 50 percent. From detailed algae sampling and analysis, it appears that each of the seven stations located throughout the Porcupine Creek drainage and upper estuary has a characteristic flora, which varies greatly in quantity and composition throughout the year.

In addition to conducting field and laboratory research, the personnel involved in habitat investigations are actively involved in providing reviews, evaluation, scientific critiques, impact assessment and expert testimony to various committees and organizations. Several dredging-related projects, e.g., "The effect of flow-lane disposal" and "Biological effects of sediment scouring" helped the U.S. Army Corps of Engineers manage navigational dredging in the Columbia River with a minimum impact on fishery resources. Our benthic and finfish sampling throughout the estuary provided the U.S. Fish and Wildlife Service the data base necessary to develop preliminary habitat classification and evaluation of the estuary. The research results were also used by other State and local agencies assessing the impact of estuarine development.

Northeast Fisheries Center activities

Levels of dissolved oxygen and other environmental factors were again assessed off Long Island and New Jersey where the anoxia (dissolved oxygen depletion) occurred in summer 1976, killing a significant portion of the resident biological community. Enough data now have been accumulated and correlated to permit

the prediction of the likelihood of such future instances. A book on this topic, Anoxia in the New York Bight, will soon be published.

A third year of abundance surveys of American lobster larvae in southern New England waters, directed by technical advisory committees in which Center personnel play a major role, have shown densities as high as one individual per cubic meter in Buzzards Bay. This is an apparent record density, pointing to the likely importance of Buzzards Bay in the early life history of southern New England lobsters.

The distribution and abundance of nutrients and chlorophyll over the Continental Shelf from Cape Hatteras to the Canadian border have been mapped for the first time. Preliminary analyses of the taxonomic makeup of the phytoplankton populations indicates a dominance shift in the past decade from large diatoms to smaller phytoplankters. Research is underway to see if this shift is related to pollution. Along these lines, studies are focusing on the differences in water-column and seabed respiration between heavily polluted and relatively unpolluted areas.

The viral agent which causes spinning disease in Atlantic mehaden has been isolated with the help of the University of Maryland and the Maryland Tidewater Fisheries Administration. Infection was induced in the lab through inoculation and water exposure. American shad are also susceptible to the lethal virus.

A 2-year study of the distribution of potentially pathogenic amoebae in polluted marine sediments indicated that these organisms are important indicators of sewage sludge persistence in the marine environment. Cooperative cruises with the U.S. Food and Drug Administration and U.S. Environmental Protection Agency recovered such pathogens from 25 to 80 percent of all samples also positive for fecal and non-fecal bacteria. In contrast, such pathogens were recovered from only two percent of the samples negative for bacteria.

Additionally, two new genera and species of marine amoebae were described.

Diagnostic services were provided to foreign and domestic organizations interested in controlling the spread of exotic molluscan diseases and parasites. Fifteen hundred seventy-two oysters, clams, mussels, abalone, and conchs from 10 States and one Canadian province were histologically examined.

The National Registry of Marine Pathology was enlarged by, among other materials, 150 microslides of histologic lesions of marine finfish and shellfish cultured in Japan. The registry was also enlarged by a listing of 2,500 abstracted citations on diseases of North American fishes, crustaceans, and mollusks. This listing was further summarized as to geographic distribution, host species, gross and microscopic lesions, and causative agents.

Southwest Fisheries Center activities

Striped Bass. Scientists at the Southwest Fisheries Center's Tiburon Laboratory presented evidence to the State of California Water Resources Control Board that changes in water quality of the San Francisco Bay-Delta resulting from increasing human population and industry may have adversely affected fisheries resources.

In 1979, for example, striped bass in San Francisco Bay were found to be in extremely poor condition and the spawning fish appeared to be in worse condition than those in 1978. The bass collected during their upstream spawning migration were analyzed by pathological autopsies and tissue analyses. High degrees of parasitism were found in 54 percent; abnormalities occurred in 37 percent; and open wounds were found in 35 percent of the striped bass sampled.

As one consequence of these findings, the California Water Resouces Control Board established a research project and delegated scientists to work cooperatively with

physiologists and fishery biologists at the Tiburon Laboratory on the striped bass problem.

Southeast Fisheries Center activities

Many research studies were completed in the Southeast Fishery Center; however, the most significant and generally useful research products were reviews and summarizations of past and present research. They show how the ecoystems operate, how valuable they are and how they would be affected by man induced changes. One such development was a mathematical model of trophic dynamics in seagrass communities. In this model, the trophic dynamics of epifauna and omnivorous and carnivorous juvenile fish was used to simulate and predict the response of these organisms to temperature and biotic factors within an eelgrass community.

- Two reviews were presented at a national wetlands symposium. These two papers deal with the importance of estuarine habitat to fishery productivity, including economic considerations.

- The relationship between geochemical processes and bioavailability of trace metals, were reviewed. This included a discussion of research strategies necessary to develop more realistic water quality criteria for protection of fishery resources.

- A preliminary conceptual model was also developed to describe the relationship between fishery yield and the productivity of estuarine and nearshore ecosystems along the southeast coast of the United States.

- Research personnel assisted the Environmental Protection Agency (EPA) and the Department of Justice in a suit regarding the alteration for development of mangrove areas in south Florida. They also assisted EPA in the development of regulations governing disposal of municipal wastes in the marine environment and helped write a technical support document to explain those regulations. EPA and other NOAA components were helped in their assessment of an oil spill in Port Neches, Texas, and a pesticide incident in Chesapeake Bay.

Special programs

Aquaculture

Aquaculture affords the opportunity to supplement the availability of selected marine species of fish and shellfish, which are in short supply and high demand. In addition, aquacultural techniques can be utilized for enhancing recreational fisheries as well as rehabilitating populations of endangered or threatened species. To this end, aquaculture research at NMFS laboratories addresses the biological and technological impediments to commercial development and natural stock augmentation by public hatcheries. The NMFS has also cooperated with other Federal agencies at the National level to foster aquaculture development in the United States.

On January 9, 1979, the Committees on Atmosphere and Oceans, and Food and Renewable Resources, of the Federal Coordinating Council for Science, Engineering and Technology formally chartered the Joint Subcommittee on Aquaculture (JSA). The JSA (comprised of 13 Federal agencies) has the responsibility to increase the overall effectiveness and productivity of Federal aquaculture research, development, and assistance programs. NOAA represents the Department of Commerce on the JSA through the NMFS, the Office of Sea Grant, and the Office of Coastal Zone Management. The NMFS has been an active participant in the JSA through contribution of personnel and funding to accelerate aquaculture development on the Federal level. Projects for which NMFS has made major input include: developing a National Aquaculture Plan; establishing a system for translating foreign publications on aquaculture research and development; developing a means for collecting statistics on the aquaculture industry; and contributing funds for a study on the extent and character of the array of regulations applying to aquaculture activities, and needs of the aquaculture industry for financial aid.

At the field level, molluscan culture studies of the Northeast Fisheries Center continue to be directed towards solving the problems associated with spawning, nutrition, disease, and genetics of oysters, surf clams, and bay scallops.

Experimental field rearing of hatchery-produced bay scallops yielded 80-90 percent survival after 11 weeks in vertically deployed cylindrical nets in Long Island Sound waters. An additional year of research should confirm whether this method has commercial application.

Selective breeding experiments on the American oyster, Crassostrea virginica, in 1979, demonstrated that: (1) size differences among adults do not yield differences among their larval offspring; (2) the fastest growing, earliest setting larvae became the fastest growing young juvenile spat, a finding that has direct application to hatchery production; and (3) between 7 and 18 months of age, any size differences between early and late setters become lost. Inbreeding of the American oyster resulted in lower survival rates for second generation larvae.

Research on algal production (necessary for feeding larval shellfish) showed that: (1) an algal growth media with twice as much salinity as normal enhanced production of flagellated algae; (2) living algal cells were far superior to freeze-dried algal particles as a larval food source; (3) among previously untested algal species, some were considerably better than others in promoting larval growth, indicating potential as new food sources; and (4) depending on the algal species, washed algal cells and bacteria-free algal cultures yielded better larval growth than unwashed cells or bacterized cultures.

The seasonal growth of cultured surf clams from lengths of 18-50 mm. was again demonstrated utilizing pumped raceway systems. Ambient phytoplankton, the sole nutrition source, varied in abundance from previous years; yet, the overall growth rates were comparable. Hatchery-produced seed surf clams, planted unprotected in

Long Island Sound waters, were almost totally eliminated after one week by predators. Protective cages appear more promising for field rearing of surf clams.

An ozone-ultraviolet light quarantine system was developed to disinfect seawater effluent from samples of shellfish eggs, larvae, and allied bacteria to prevent unintentional introduction of exotic shellfish and associated disease organisms. Another possible quarantine method, chlorine application, resulted in harmful discharges to receiving estuaries. Paralytic shellfish poison (the Northeast and Middle Atlantic States' "red tide") in soft-shell clams was inactivated using only an ozone treatment. Disease potential in larval shellfish cultures was reduced by the application of ultraviolet light.

Over 450 bacteria from Long Island Sound were tested for pathogenicity to American oyster larvae; 11 were positive. Experiments with a known pathogen (Pseudomonas sp.) to American oysters revealed which fractions of its red pigment are toxic to developing embryos. New techniques for studying disease immunity in larval and adult American oysters were tested. These new techniques have already revealed an immune reaction to a pathogenic Vibrio sp. bacterium in 2-day-old larvae.

Pathobiological assistance to the shellfish aquaculture industry included: (1) isolation and elimination of a disease organism from a California hatchery; (2) provision of useful microbial food cultures to hatcheries; and (3) identification of pathogens from Long Island hatcheries.

At the Northwest and Alaska Fisheries Center's (NWAFC) Auke Bay Laboratory, aquaculture research in 1979 continued to focus on multiple factors that influence ocean ranching of salmon and hatchery developments in Alaska. Much of the research was cooperatively involved with other groups including regional aquaculture associations, the Alaska Department of Fish and Game, University of Washington, Oregon State University, Sheldon Jackson College, and tribal Indian groups.

The new salmon aquaculture program to test theories on the causes of variable estuarine marine survival of juvenile salmon entered its second year. Highlights included the initiation of field and laboratory studies on feeding behavior of pink and chum salmon fry; studies on relationships between scale growth histories and environmental data; a field test confirming validity of the hypothesis that fry (length to 6 cm) tend to concentrate in estuarine areas where shoreline topography and currents combine to enhance surface mixing, abundance of zooplankton, and shelter; and a completed report summarizing 20 years of observations on the influence of the marine environment on age and size at maturity and survival and growth of chum salmon in Prince William Sound, Alaska. 1/

A 45-year record high number of 138,529 adult pink salmon returned to Sashin Creek weir at Little Port Walter. The adults were derived from only 1.8 million fry (8 percent survival), emphasizing again the importance of marine survival in the population dynamics of anadromous salmon. Although these adults were not produced from hatchery fry, previous generations of the same lineage have had recent major involvement with hatchery production indicating the hatchery experience was not detrimental to subsequent natural production of the same stock.

Expected increases in hatchery releases of salmon in the next decade will require increased feed production. Supplies of high-quality herring meal and herring oil, major salmon-diet ingredients, are not expected to meet future demands. To meet these needs, alternative protein and lipid sources are being studied at the NWAFC in Seattle, Washington. Studies relating to the use of alternate sources of proteins in salmonid diets showed that the differences in nutritional requirements between species is greater than previously suspected.

[1] Helle, J. H. 1979. Influence of marine environment on age and size at maturity, growth, and abundance of chum salmon, *Oncorhynchus keta* (Walbaum), from Olsen Creek, Prince William Sound, Alaska. Ph.D. Thesis, Oregon State University, Corvallis. 118 p.

Rainbow trout were successfully reared on OMP-type diets in which 100 percent of the fishmeal portion of the diet was replaced with single-cell protein (bacterial origin). Coho salmon, however, exhibited very poor growth when fed the same diets. Other studies showed that soy meal could only serve as a partial replacement for fishmeal and that factors contributing to its unsuitability were related to the ability of the soy to bind trace minerals such as zinc, iron, and copper. The ion-binding capacity was found to be associated with fiber and/or carbohydrate fractions of the soy. 2/

Fishery agencies recognize that releasing hatchery smolts better fitted for marine survival may produce the same results as increased production at a lower cost than constructing and operating new hatcheries. In 1978, a 3-year study was undertaken by the NWAFC's Manchester Field Station and the Pacific Northwest Regional Commission to develop biochemical and endocrinological indexing methods to monitor smolt quality and determine optimum times for releasing migrants from Columbia River hatcheries.

In 1979, a strong relationship was found between one biochemical indicator, Na+ -K+ ATPase, and migrational patters in fall chinook salmon. Chinook salmon populations released at peaks of enzyme activity migrated to and through the estuary more rapidly than those released prior to or following enzyme peaks. A naturally occurring blood hormone, serum thyroxine (T4), also appears to indicate smolting. In most cases, seasonal surges in T4 coincide with NA+ - K+ ATPase peaks and are related to improved seawater adaptability. The use of such biochemical indicators to determine optimum release dates should lead to improved adult runs.

Aquaculture research of the Southeast Fisheries Center was directed towards solving problems associated with the culture of penaeid shrimp and freshwater prawns, and a head-start program for enhancing populations of endangered marine turtles.

Two species of penaeid shrimp, Penaeus stylirostris and P. setiferus, were successfully matured under controlled conditions and out of phase with natural reproduction periods. Using artificial light, controlled temperature, and semicontrolled salinity, approximately 30 female P. stylirostris spawned 170 times between August and October 1979, producing about 54,000,000 eggs and 28,000,000 naupli. P. setiferus produced 4,335,000 eggs in 63 spawns but the eggs were not fertilized.

Several water treatment systems for recirculating marine water were tested under actual shrimp culture conditions. The best water chemistry was maintained with a combination of tube settler and lighted biodisc, but best shrimp growth was obtained in the control raceways when the load of metabolites was high in the recirculating water.

Significant advances in reducing the costs of shrimp hatchery production were made by demonstrating the effectiveness of using yeast as a substitute for marine algae as a food for larval shrimp.

Studies on the freshwater prawn (Macrobrachium sp.) are addressing the nutritional requirements of this species to optimize growth and develop cost-effective feeds. A study commenced in 1979 to determine the significance of dietary fiber for juvenile Macrobrachium rosenbergii.

A turtle head-start program to increase the survival of Kemp's ridley turtles during their first year of life was initiated. Over 2,000 yearling turtles were tagged and released after reaching at least one pound in weight. Selected turtles were equipped with miniature radio transmitters and followed up to 30 days at sea to determine initial movements and survival after release. Some turtles have been recovered after 8 months of liberty that had gained 10 pounds in weight.

[2]Wekell, J. C. and J. Spinelli. 1978. Changes in the ion-binding capacity of heat-treated soy. Proceedings of Northwest Fish Culture Conference, Vancouver, Washington, December 5-7, 1978.

Columbia River fisheries development

Hatcheries

Pollution abatement facilities were constructed at Big Creek, Klaskanine, Sandy, and Bonneville hatcheries in Oregon and at Beaver Creek and Little White Salmon hatcheries in Washington. The construction of these facilities was part of a continuing program to reduce pollution from all NMFS-funded hatcheries to the legal limitations established by the Environmental Protection Agency.

Quality control and evaluation studies

In 1979, an ongoing investigation to determine the relationship between survival and the amount of a specific enzyme adenosine triphoshatase (ATPase), present in gill tissue at time of release, was expanded to evaluate and compare the significance between that enzyme and other physiological parameters which may be correlated with the parr-smolt transformation process and fitness for marine survival. Besides sampling ATPase and blood-sodium levels at the hatcheries, personnel from the NMFS Manchester Field Station transported a small portion of 1979 selected release groups to saltwater net pens to determine saltwater survival. The analyses of these smoltification parameters are providing important guidelines for determinig the correct time for releasing smolts from hatcheries.

A project to develop spring chinook salmon stocks in the Clearwater River, Idaho, was initiated several years ago and releases of excess hatchery fry have been supplemented by production from various incubation channels. Eyed eggs for the channels have been provided by the Washington Department of Fisheries, the Idaho Department of Fish and Game (IDFG), and the U.S. Fish and Wildlife Service. In 1979, because of a shortage of excess eggs due to a poor run of spring chinook, only the Indian Creek Incubation Channel was operated. In October, 2.5 million eyed eggs were transported from Cowlitz Hatchery in Washington by IDFG and U.S. Forest Service personnel and placed in the gravel. A channel tender was hired to protect the channel from vandalism and to monitor water-flows. Outmigrants from the channel were trapped and will be enumerated in May and June of 1980.

A study is currently underway to determine the effect of releasing similar-sized coho salmon at three different times during the year. Groups of marked coho are being raised at two Oregon Department of Fish and Wildlife hatcheries, Big Creek and Klaskanine, and two Washington Department of Fisheries hatcheries, Toutle and Washougal. Feeding schedules at each hatchery have been adjusted so that the three releases can be made in May, June, and July at 18 fish/pound. As a part of this study, the groups are being monitored for ATPase activity during rearing and at release. A sample will be transported to the NMFS Manchester Field Station for saltwater survival tests.

The Kalama River steelhead investigations were initiated in 1979 to assess possible adverse impacts of stocking hatchery-reared steelhead upon wild salmonid populations, with primary emphasis being placed on the freshwater-interaction between hatchery-reared and wild summer steelhead. Included in the investigations are studies covering: (1) wild steelhead downstream migrants; (2) the effects of hatchery-reared steelhead upon wild steelhead populations as expressed by standing crop and biomass; (3) the contribution of the progeny of hatchery-reared steelhead to wild steelhead recruitment through the use of a gene marker; (4) the interactions between hatchery and wild steelhead during spawning; and (5) the basic life history and population dynamics of hatchery-reared and wild steelhead in the Kalama

River. Data were collected during the year and results have been published as a Washington Department of Game "Fishery Research Report."

In 1979, a 9-year cooperative study to evaluate Columbia River fall chinook hatcheries was initiated. This study is being primarily funded by the Bonneville Power Administration, U.S. Department of Energy, and is being coordinated by NMFS. Starting in 1979 and continuing through 1982, a percentage of all of the fall chinook reared in hatcheries on the Columbia River and its tributaries will be given distinct adipose-coded wire tag marks. During each of the 4 years, more than 3 million fish will be marked. After release, the fish will be monitored while migrating downstream, in the fisheries, and upon return to the hatcheries. Since the number of fish to be marked is so great, it was necessary to supplement existing marking equipment by building a mobile fish-marking unit which contains six marking machines. This unit will be used starting with the 1980 marking season.

Fish facilities

During 1979, NMFS assisted in the development of functional designs for fish protective facilities at more than a dozen Federally-funded and Federal Energy Regulatory Commission licensed hydro power projects, including Bonneville and John Day Dams on the Columbia River. Facilities included fish ladders, fish collection systems, fish screens, and bypasses for safe passage of adult and juvenile anadromous fish. NMFS also provided assistance in the design and construction of facilities at seven Columbia River Fisheries Development Program hatcheries and responded to numerous requests for assistance from other agencies. Some of these agencies were: Federal Energy Regulatory Commission (Conowingo Hydro Project); U.S. Fish and Wildlife Service (Michigan fish ladders); NMFS Southwest Region (Pheripheral Canal fish screens); U.S. Forest Service (Sawtooth National Recreational Area fish barrier problems). In addition, NMFS assisted in conducting an inspection of fish protective screens at more than 200 water withdrawal sites on the Columbia and Snake Rivers.

NMFS personnel participated on several interagency committees dealing with fish passage problems. One of these was a new Instream Flow Studies Work Group formed to study Columbia Basin hydro project operations in an effort to optimize water use for fish and power within the constraints of other uses.

Transportation of salmonid smolts

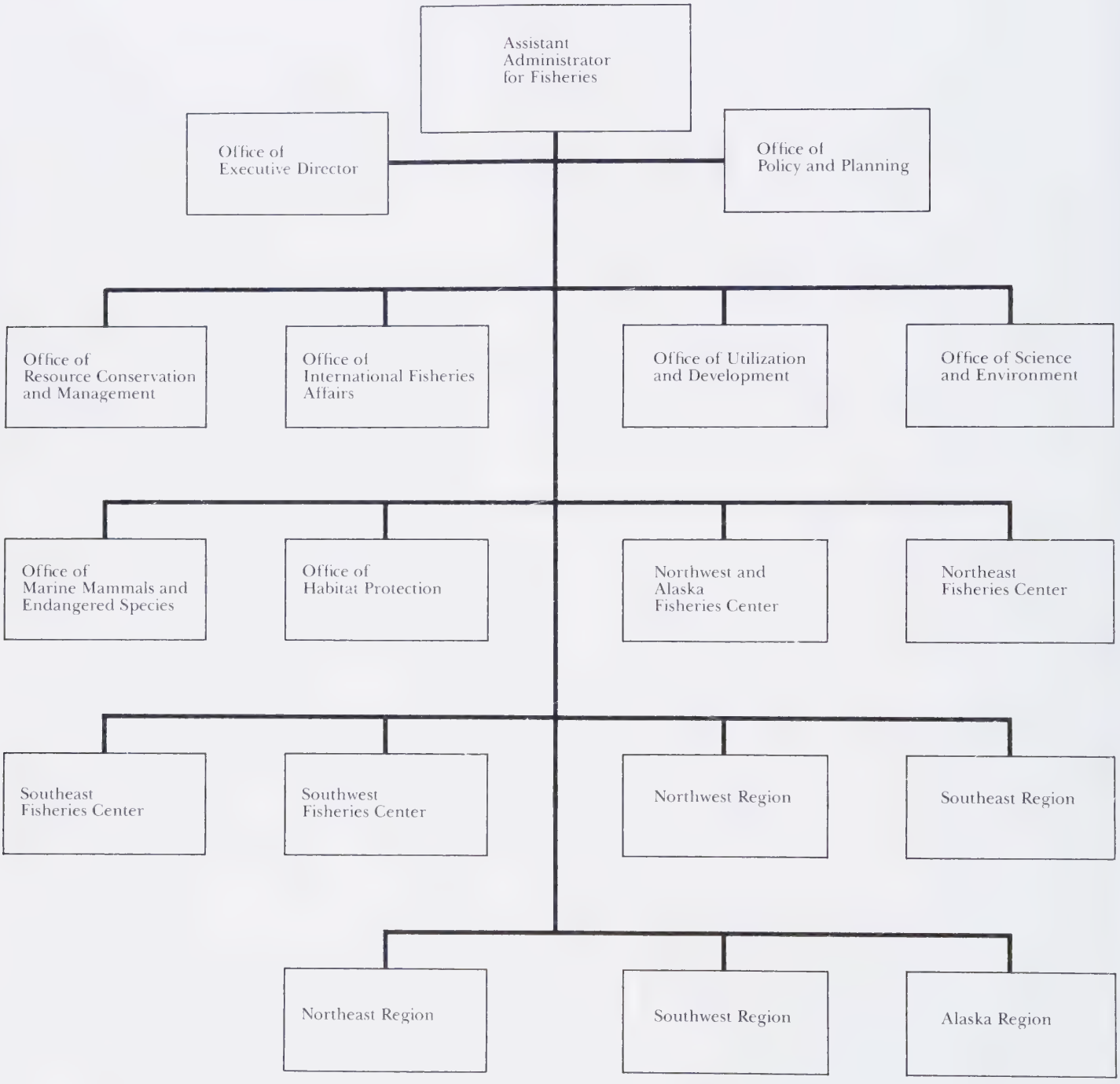
In 1979, tangible benefits were realized from a two-phase cooperative effort initiated in 1979 between the NMFS and other Federal and State fishery agencies and the U.S. Army Corps of Engineers, Bonneville Power Administration, and other water management entities of the Pacific Northwest. Phase one provides protection for juvenile salmonids (smolts) migrating down the Snake River by collecting them at Lower Granite and Little Goose Dams and transporting them by barge or truck to safe release sites in the Columbia River below Bonneville Dam. The second phase provides protection for smolts migrating seaward in the Columbia River by: (1) mass transporting all smolts collected at McNary Dam, (2) augmenting river flows to minimize delay and mortality of smolts passing through reservoirs, and (3) providing strategic spill at dams to pass smolts past dams via the spillway instead of through the much more dangerous turbines.

This cooperative effort, in which NMFS provides a considerable portion of the needed scientific and technical expertise, achieved significant benefits in 1979 by materially increasing the number of smolts surviving to the Columbia River below Bonneville Dam. In 1979, over 5 million smolts were transported around the dams and 7 million additional smolts, aided by the modified river flows, survived the gauntlet of reservoirs and dams. The 12 million fish total is considerably higher than the 5 to 7 million fish totals estimated for the years 1975 through 1977.

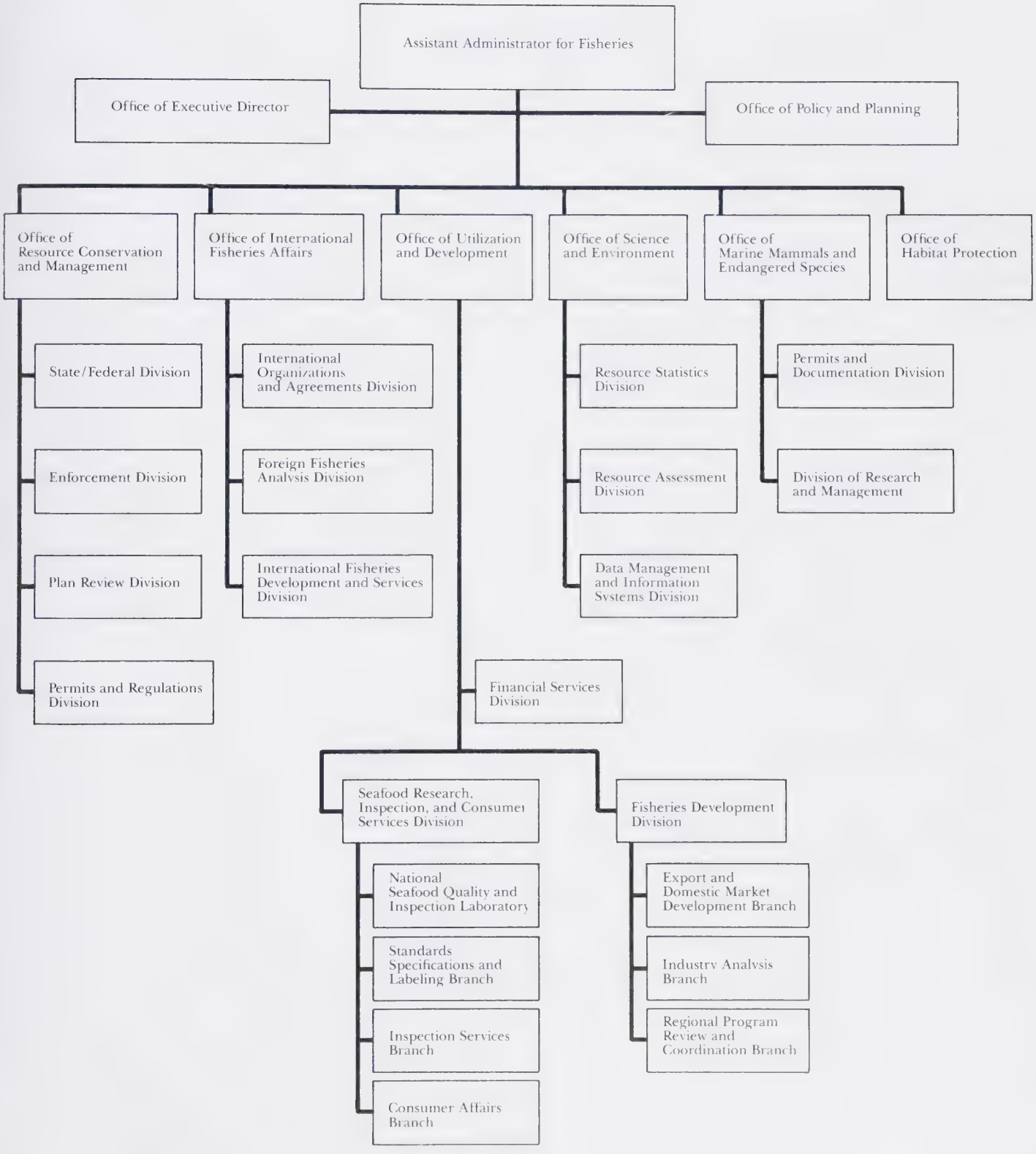
Appendices

Appendix I NMFS organization

National Marine Fisheries Service



NMFS headquarters


Assistant Administrator for Fisheries
Office of Executive Director
Office of Policy and Planning
Office of Resource Conservation and Management
Office of International Fisheries Affairs
Office of Utilization and Development
Office of Science and Environment
Office of Marine Mammals and Endangered Species
Office of Habitat Protection
State/Federal Division
Enforcement Division
Plan Review Division
Permits and Regulations Division
International Organizations and Agreements Division
Foreign Fisheries Analysis Division
International Fisheries Development and Services Division
Resource Statistics Division
Resource Assessment Division
Data Management and Information Systems Division
Permits and Documentation Division
Division of Research and Management
Financial Services Division
Seafood Research, Inspection, and Consumer Services Division
Fisheries Development Division
National Seafood Quality and Inspection Laboratory
Standards Specifications and Labeling Branch
Inspection Services Branch
Consumer Affairs Branch
Export and Domestic Market Development Branch
Industry Analysis Branch
Regional Program Review and Coordination Branch

Appendix II Major litigation

Litigation involving endangered species

Hopson v. Kreps (U.S. Court of Appeals for the Ninth Circuit)

This case was filed in July 1978 in U.S. District Court in Alaska (Civil No. A 78-184). The plaintiffs are Alaska natives seeking to invalidate regulations that restrict their taking bowhead whales. In 1977, the International Whaling Commission (IWC) determined that the bowhead whale should be protected and placed quotas on subsistence bowhead takings. The United States is a party to IWC and has implemented these quotas under the authority of the Whaling Convention Act of 1949. Plaintiffs argue that the IWC and the Whaling Convention Act do not authorize any regulation of native subsistence whaling and that the United States cannot impose any restrictions on the native take of bowheads.

On January 11, 1979, U.S. District Court Judge Van der Heydt dismissed plaintiffs' action for lack of jurisdiction because the U.S. regulations enforcing the IWC quotas are so directly linked to the conduct of U.S. foreign relations. In February 1979, plaintiffs filed an appeal with the Ninth Circuit and briefs have been filed by both parties. The plaintiffs' motion for an expedited appeal was denied by the Ninth Circuit, but at the request of both parties, that motion is being reconsidered.

National Wildlife Federation, et al., v. Endangered Species Committee, et al. (U.S. District Court, District of Columbia; Civil No. 79-1779)

The Pittston Company v. Endangered Species Committee, et al. (U.S. District Court, District of Columbia; Civil No. 79-1851)

In July 1979, the National Wildlife Federation, the Environmental Defense Fund, the Natural Resources Council of Maine, and the Conservation Law Foundation of New England filed suit against the Endangered Species Committee, Secretary Andrus, Secretary Kreps, and the Review Boards convened to review the applications filed by the Pittson Company for an exemption from the Endangered Species Act. The Pittston Company had applied for an exemption that would have allowed it to construct an oil refinery in Eastport, Maine, notwithstanding the conclusion of the Department of the Interior and NOAA that the refinery might jeopardize the continued existence of the bald eagle, the right whale, and the humpback whale, all of which are endangered species. The plaintiffs sought an injunction against further Board proceedings on the ground, among others, that the Pittston Company's application for an exemption from the Endangered Species Act was not "ripe" for consideration. Subsequently, the Pittson Company filed a counter suit, arguing that its application should have been considered without delay.

On July 18, 1979, a stipulation was agreed to by all parties to both suits that the proceedings of the Review Boards were stayed until a final decision by the Environmental Protection Agency (EPA) on Pittston's pending application for a National Pollutant Discharge Elimination System (NPDES) permit or until a Court ordered otherwise. Oral arguments on the merits of both suits were presented to the Court on August 8.

The major issue in the two suits was an apparent ambiguity in the 1978 amendments to the Endangered Species Act concerning when an exemption application was to be filed by an applicant for a Federal permit or license. One provision stated that applications were to be filed after denial of a license or permit primarily on endangered species grounds. Another stated that applications were to be filed within 90 days of the completion of the consultation process. In December 1979, new amendments to the Act, including new exemption provisions in Section 7, were enacted. One amendment states that applicants for Federal

licenses or permits can apply for exemptions only after the Federal agency concerned takes final agency action; the 90-day provision no longer applies to such applicants.
The case was still pending at the end of 1979.

Cayman Turtle Farm, Ltd. v. Cecil D. Andrus, et al. (U.S. Court of Appeals, District of Columbia Circuit; Civil No. 79-2031)

On September 6, 1978, Cayman Turtle Farm, Ltd., brought an action in U.S. District Court for the District of Columbia, against the Secretaries of the Interior and Commerce, to review regulations listing and protecting populations of green sea turtles as threatened or endangered species under the Endangered Species Act. Conservation groups, led by the Environmental Defense Fund, intervened in the suit, on the side of the Government. Cayman's primary allegation was that the regulations should have allowed for an exemption for trade in turtle products derived from green sea turtles raised in captivity. Because the regulations did not provide for such an exemption, the Turtle Farm, located on the Grand Cayman Island in the Bahamas, was prohibited from exporting its products to the United States. The defendant agencies oppose such an exemption, primarily because of concerns that the exemption would stimulate a market for green sea turtle products, and that the market would induce people to supply it by capturing wild, rather than captive-grown, turtles.
On May 29, 1979, District Court Judge John J. Pratt granted the motions of the Federal officials and intervenor wildlife groups and dismissed the action. On July 27, 1979, Cayman appealed to the U.S. Court of Appeals, where a decision was pending at the end of 1979.

Conservation Law Foundation et al., v. Andrus and Kreps (U.S. Court of Appeals, First Circuit; Civil No. 79-1585)

In this case, plaintiffs argued that the Georges Bank Lease Sale #42, off the New England coast, will violate various Federal laws, including the prohibition in Section 7(d) of the Endangered Species Act against making an irreversible commitment of resources which is likely to foreclose reasonable and prudent alternatives that would avoid jeopardizing of humpback whales. In denying plaintiffs' motions for a preliminary injunction, the District Court in Massachusetts held that no such commitments were made because of the lease stipulations which conditioned the rights of successful lease applicants. The first Circuit upheld the District Court, finding that the Endangered Species Act will continue to apply to actions taken by the Secretary of Interior subsequent to the lease sale.

North Slope Borough et al., v. Andrus and Frank (U.S. District Court, District of Columbia; Civil No. 79-3193.)

National Wildlife Federation et al., v. Andrus and Frank (Civil No. 79-3199.)

Village of Kaktovik et al., v. Andrus and Frank (Civil No. 79-3216.)

These three cases involve allegations that the decision of the Secretary of the Interior to proceed with the joint Federal/State of Alaska Beaufort Sea Lease Sale violates Federal law. All three plaintiffs argued that there were procedural and substantive violations of several Federal laws and a trust responsibility to the Alaska native groups.
Plaintiffs alleged violations of Section 7 of the Endangered Species Act in the decision to proceed with the sale, including a failure to insure that the action was not likely to

jeopardize the endangered bowhead whale, and that the decision to proceed with the lease was an irreversible or irretrievable commitment of resources which was likely to foreclose reasonable and prudent alternatives in violation of Section 7(d). Two of the plaintiffs also argued that the lease sale would result in a "taking" of marine mammals in violation of the Marine Mammal Protection Act. Judge Robinson of the U.S. District Court for the District of Columbia denied the plaintiffs' motions for preliminary injunction. At the end of 1979, the Judge was considering cross-motions for summary judgment.

Marine Mammal Protection Act

American Tunaboat Association, et al., v. Klutznick, et al. (U.S. District Court, Southern District of California; Civil No. 79-2033-N.)

The plaintiffs filed a motion to prevent NMFS from changing the originally announced date for a formal hearing to consider proposed regulations regarding incidental taking of porpoise in the eastern tropical Pacific Ocean tuna fishery. The original April 15, 1980, date was moved tentatively by NMFS to February 18, 1980, because of a possible need to adjust the regulations to take into account new scientific information suggesting that northern offshore spotted dolphin, a major target species of the tuna industry when fishing "on porpoise," may be depleted. The Government's motion to dismiss was granted because plaintiffs had not exhausted administrative remedies by presenting arguments for a delay to the Administrative Law Judge presiding over the formal hearing.

Globe Fur Dyeing Corporation v. United States of America, Kreps, Frank, and Schoning (U.S. Court of Appeals, District of Columbia; No. 79-1087.)

Plaintiff Globe Fur Dyeing Corporation brought suit in 1978, seeking to have Section 102(b)(2) of the Marine Mammal Protection Act declared unconstitutional (U.S. District Court, District of Columbia; Civil No. 78-0693). This provision prohibits the importation of marine mammals (including raw, dressed, or dyed fur or skin) if the mammal was nursing at the time of taking or less than 9 months old, whichever occurs later. The plaintiff imported animal skins before passage of the Act.

On November 16, 1978, a Federal judge held that the challenged provision was not unconstitutional and granted the defendant's (the U.S.) Motion for Summary Judgment. The Judge found this provision rationally related to the goals of the Act, such as conservation and preservation of aesthetic and ethical values.
During 1979, the plaintiff appealed to the D.C. Circuit Court of Appeals. Briefs have been filed and the court has held oral argument; however, no decision had yet been issued by the end of 1979.

LeVasseur, Sipman and White v. Atkinson, Leitzell et al. (U.S. District Court, Hawaii; Civil No. 78-1095)

The plaintiffs, LeVasseur, Sipman, and White sued to prohibit the capture and transport of four dolphins to a scientific research facility at the University of Hawaii. The NMFS had issued a scientific research permit to allow these activities. Plaintiffs alleged that the dolphins would suffer injury at this facility, that the facility failed to meet the standards required by the Act, and that NMFS has violated the requirements of the National Environmental Policy Act (NEPA) in issuing this and other scientific research permits.
On June 2, 1978, the date the complaint was filed, a Federal judge issued a Temporary Restraining Order to stop NMFS and its agents and representatives from capturing the dolphins. On June 7, the judge rejected plaintiffs' second Motion for a Temporary Restraining Order to expand or extend the first Order because the

period for judicial review of permits provided for by the Act had expired before the Plaintiffs filed suit. On November 28, 1978, plaintiffs filed an amended complaint.
No action on this case has taken place in 1979.

Marine Wonderland v. Kreps (U.S. Circuit Court of Appeals for the District of Columbia; 610 F.2d 947)

Appellants in this action had been charged by the agency with a violation of the import moratorium of the Marine Mammal Protection Act. Appellants sought to overturn the decision of the U.S. District Court for the District of Columbia that the agency could proceed with its administrative procedures to impose civil penalties. Marine Wonderland argued that the agency was without jurisdiction, as the landing of their dolphins in Texas had been outside their control and that in any event, landing dolphins in the United States without an intent to leave them here was not an importation under the MMPA.
The Government argued, and the District Court subsequently ruled, that those issues should be resolved by the administrative agency. The Circuit Court upheld the decision of the District Court ruling that the agency was not patently without jurisdiction and that the matter shold be returned to NOAA for fact finding and initial determination.

Clean Water Act of 1977

Deltona Corporation v. Alexander, Costle, Andrus, Kreps, et al. (U.S. District Court, Southern District of Florida; Civil No. 79-345-Civ.-SMA)

Plaintiff filed a petition for mandamus on January 23, 1979, to require the Secretary of the Army to enter into agreements with other Federal agencies (including the Department of Commerce) as mandated by S404(q) of the Clean Water Act of 1977. The agreement would provide ways to minimize paperwork and delays involved in issuing S404 ("dredge and fill") permits.
In September 1979, the Court heard argument on the plaintiff's motion for summary judgment, but reserved its ruling on the motion until January 1980, in order to give the defendants an opportunity to continue their negotiations toward an agreement.
NMFS, which has been delegated NOAA authority under the Fish and Wildlife Coordination Act to represent the Department of Commerce on issues concerning conservation of living marine resources and their habitats, had been for some time negotiating an agreement with the Army, Interior and EPA. However, by the end of 1979 the agreement had not been completed.

Fishery Conservation and Management Act of 1976

United States v. KAIYO MARU No. 53 (U.S. District Court; Alaska, Civil No. A79160)

On January 2, 1979, the Coast Guard seized the KAIYO MARU, a Japanese stern trawler fishing in the FCZ off Alaska. Inspection revealed massive underlogging of valuable species such as ocean perch and squid, as well as 11.57 t of halibut, a prohibited species. As a result, the United States initiated a civil forfeiture proceeding against the vessel in the Federal District Court for Alaska. The agency, on the same day, issued a notice of permit sanction in which it revoked the vessel's permit, effective immediately, and with prejudice to the issuance of a new permit until 1981. The owner sought to challenge the immediate revocation of the permit, but, in an opinion of July 16, 1979, a Federal magistrate

upheld the agency's action. The District Court on February 1, 1980, held that permit sanctions could be imposed only after a hearing had been held to determine whether the vessel was used in committing a violation.

United States v. TSUDA MARU (U.S. District Court, Alaska; 470 F. Supp. 1223)

The Japanese fishing vessel TSUDA MARU was seized in January 1979. Permit sanction proceedings were instituted, based on charges that the vessel was violating FCMA regulations (i.e., for significant underlogging of its catch). The United States also initiated a civil forfeiture action against the vessel in the Federal District Court for Alaska. The plaintiff challenged the Government's suit by claiming that the warrantless search of the TSUDA MARU, which resulted in the discovery of the violation, was invalid. The court, however, ruled that the agency's actions were constitutional and that routine warrantless inspections to enforce FCMA were valid.

New England Fish Co. v. Kreps (U.S. District Court, District of Columbia; Civil No. 79-1196)

On May 1, 1979, the New England Fish Company and certain other U.S. fish processors and a fishermen's group filed a civil suit challenging NOAA's interpretation and implementation of Public Law 95-354, the so-called "joint venture amendment" to FCMA. Plaintiffs alleged, among other things, that the public had not been given an adequate opportunity to comment on certain applications for foreign fishing vessels that would engage in joint ventures, that NMFS had failed to rely on U.S. processors' statements of intent as determinative of how much fish they would process, and that fish caught by U.S. harvesters and processed by foreign fishing vessels in joint ventures would count against the total allowable level of foreign fishing (TALFF). Defendants sought to invalidate permits that had been issued to Korean vessels for a joint venture off Alaska, and to prevent issuance of similar permits to certain U.S.S.R. vessels.

NOAA's answer to the complaint generally denied that the agency had acted illegally in any way concerning the subject joint venture permits and determiniations. Korea Marine Industries Development Corporation (KMIDC) intervened in the case. In December 1979, plaintiffs and the Government defendants submitted a settlement agreement for the approval of Judge Joyce Hens Green. In the proposed settlement agreement filed with the Court, NOAA agreed to clarify procedures that allow the public to comment on foreign joint venture applications before decisions are made on them. NOAA also agreed to make available to the public an explanation of how the agency determines its estimates of U.S. harvest, the amounts that will be used by U.S. fish processors, and how much of the U.S. harvest may be made available for joint ventures. Confidential data used to determine the estimate would not be made public.

Settlement negotiations between plaintiffs and intervenor KMIDC were ongoing at the end of 1979.

Confederated Tribes v. Kreps (U.S. District Court, Oregon; Civil No. 79-541)

This case was filed on May 18, 1979. The original plaintiffs were four Indian tribes with adjudicated treaty fishing rights on the Columbia River. The complaint alleged that the 1979 regulations implementing the Fishery Management Plan for the Commercial and Recreational Salmon Fishery off the Coasts of Washington, Oregon, and California did not allow a sufficent number of salmon to enter the Columbia River to comply with their treaty fishing rights. Other Washington and Idaho tribes subsequently intervened as plaintiffs. Commercial troll organizations and the State of Oregon and Washington also intervened.

The District Court heard argument on July 11, 1979. At that time the Court remanded the regulations to the Secretary of Commerce to reconsider their impact on treaty Indian fishing, particularly in light of the standards enunciated in the recent U.S. Supreme Court

decision in Washington v. Washington State Commercial Passenger Fishing Vessel Assn. et al, 47 U.S.L.W. 4978 (July 2, 1979). On July 23, the court ordered the Secretary to implement emergency regulations designed to increase salmon escapement to rivers of interest to the treaty tribes. Emergency appeals were taken by intervening troll organizations to the Ninth Circuit Court of Appeals and to Supreme Court Justice Rehnquist. In response to an order issued by Justice Rehnquist on August 30, the Ninth Circuit Court of Appeals stayed part of the District Court's order on procedural grounds. The stay, however, did not affect the ocean salmon regulations. The trollers have subsequently dismissed their appeal in this case.

Stafne v. Frank (U.S. District Court, Western District of Washington; Civil No. 79-93S)

This case was filed on January 18, 1979, by a representative of a Washington troll association. Plaintiff sought to compel disclosure of NOAA General Counsel legal opinions relating to the 1978 Fishery Management Plan for Commercial and Recreational Salmon Fisheries off the Coasts of Washington, Oregon, and California under the Freedom of Information Act (FOIA). The Court ruled on November 8, 1979, that the documents were privileged and exempt from disclosure under FOIA.

Litigation concerning the Northern Mariana Islands

Three separate lawsuits, asserting that FCMA does not apply to the Northern Mariana Islands (NMI), were filed in the U.S. District Court for the Northern Mariana Islands during 1979. In two of the lawsuits, Marianas Fisheries Inc. v. Kreps (Civil No. 79-031), and Commonwealth of the Northern Mariana Islands v. United States (Civil No. 79-041), the plaintiffs claimed that FCMA and certain regulations promulgated thereunder prevented them from using a Japanese-built, CNMI-registered vessel, the M/V OLWOL, in the fishery conservation zone (FCZ) around the CNMI. In the third suit, Matsunaga v. Anderson (Civil No. 79-033), the plaintiffs alleged that FCMA and its regulations prevented them from using three CNMI-registered fishing vessels in the CNMI fishery conservation zone. NOAA's answer to each suit states the U.S. Government's position that the FCMA does apply in the NMI.

A proposed Presidential proclamation, which would allow citizens of the NMI or the government of the NMI to use foreign-built, U.S.-registered fishing vessels, owned by such citizens or owned by or in the custody of the Government of the NMI, to fish in the territorial sea and FCZ around the NMI and to land their catch of fish in the NMI, was under consideration by U.S. Government agencies at the end of 1979. The proclamation would moot the three lawsuits discussed above.

Massachusetts Inshore Draggermen's Association v. Hanks (U.S. District Court, Massachusetts; Civil No. 791169-N)

The Massachusetts Inshore Draggermen's Association filed a complaint on June 18, 1979, challenging those regulations implementing the Atlantic Groundfish and Herring FMP's, which require fishermen to report catch data on logbook forms.

Plaintiffs' motion for a preliminary injunction against enforcement of the challenged regulations alleged that NOAA has usurped the New England Council's authority to manage fisheries by promulgating the logbook regulations. It also claimed that the regulations violate the fishermen's privilege against self-incrimination. NOAA's memorandum opposing the motion for preliminary injunction asserted the agency's authority and responsibility under FCMA and under the two FMP's to require data reporting. It mentioned NOAA's policy in the groundfish fishery not to allow access to logbooks for enforcement purposes (other than enforcement of the requirement that logbooks be maintained and submitted) for an experimental period of 1 year.

Appendix III Fiscal year 1980 NMFS budget allocations

SUBACTIVITY	Adjusted Base FY 1980	Net Congressional	Total FY 1980
	-------Thousands of dollars--------		
Marine Resources, Assessment, Monitoring, and Prediction (MARMAP)			
Direct appropriations	21,592.7	638.0	22,230.7
S-K funds	3,706.2	-0-	3,706.2
Total	25,298.9	638.0	25,936.9
Conserving Marine Resources			
Direct Appropriations	21,770.6	639.0	22,409.6
S-K funds	152.8	-0-	152.8
Total	21,923.4	639.0	22,562.4
Restoring and increasing fishery resources			
Direct appropriations	13,877.6	4,083.0*	17,960.6
S-K funds	1,617.3	-0-	1.617.3
Total	15,494.9	4,083.0	19,577.9
Managing and using fishery resources			
Direct appropriations	30,983.4	4,352.0	35,335.4
S-K funds	20,392.5	-0-	20,392.5
Total	51,375.9	4,352.0	55,727.9
Fishery financial support services			
Direct appropriations	290.6	-0-	290.6
S-K funds	-0-	-0-	-0-
Total	290.6	-0-	290.6
Total			
Direct appropriations	88,514.9	9,712.0	98,226.9
S-K funds	25,868.8**	-0-	25,868.8
Total	114,383.7	9,712.0	124,095.7

Does not include Management Fund (MF) amount of $14,588.8K. The MF is distributed among all the subactivities, and accounts for any variances between the Administration's FY 1980 budget to Congress and those figures appearing in this report.

S-K availability determined by import duties collected. Includes S-K reserve releases from deferral by Senate Resolution 50.

*Newport Lab 2nd building 2750.0
Manchester Lab A&E 1133.0

**S-K Special Projects Fund $12.5 million

Appendix IV State of the fisheries - 1979

U.S. landings

Commercial landings (edible and industrial) by U.S. fishermen at ports in the 50 States were a record 6.3 billion pounds valued at a record $2.2 billion in 1979, up 4 percent in quantity and 20 percent in value compared with 1978, the previous record year. These increases, in large part, reflect sharply higher salmon landings and record prices for most species.

Commercial landings by U.S. fishermen at ports outside the 50 States were an additional 157.6 million pounds valued at $79.9 million. Most of these landings were tuna landed at canneries in the Commonwealth of Puerto Rico.

Edible fish and shellfish landings in the 50 States were a record 3.3 billion pounds in 1979, up 4 percent compared with 1978. Increased landings of a number of species, particularly salmon, more than offset a decline in landings of tuna and shrimp.

Landings for reduction and other industrial purposes by U.S. fishermen in the 50 States were a record 2.9 billion pounds in 1979, 3 percent over 1978. The increase is attributable to larger landings of menhaden, the dominant industrial fish, and increased landings of anchovies.

Foreign catch in U.S. FCZ

The foreign catch of fish (excluding tunas) and shellfish in the U.S. FCZ was 1,641,000 metric tons (3.6 billion pounds) in 1979, 6 percent below 1978, and 29 percent below the average for the 5 preceding years. As in other years, the FCZ off Alaska supplied by far the largest share of the foreign catch, 89 percent; Washington, Oregon, and California, 7 percent; North Atlantic, 4 percent; and Hawaii and the Pacific islands, less than 1 percent.

Alaska pollock comprised 65 percent of the foreign catch; Pacific flounders, 12 percent; Pacific hake (whiting), 7 percent; and other fish and shellfish, the remainder.

Despite a 6 percent decline in catch from 1978, Japan continued to be the leading nation fishing in the U.S. FCZ with a catch of 1.1 million metric tons in 1979. The U.S.S.R. catch of 282,000 metric tons in 1979 was down 24 percent compared with 1978. Catches by vessels of the Republic of Korea, the third most important catching nation, were 127,000 metric tons, 26 percent above 1978.

U.S. vs. foreign catch in U.S. FCZ

The combined catch by U.S. and foreign vessels in the FCZ was 2.4 million metric tons in 1979, up 2 percent compared with 1978. The rise in the U.S. catch more than offset a decline in the foreign catch, and the U.S. share rose to 33 percent of the total, up from 26 percent in 1978. Because these data on U.S. landings in some years include large quantities of anchovies

and menhaden, which are low-value fish used for industrial purposes, the increase in U.S. landings of food fish is hidden. If catches of anchovies and menhaden are removed from U.S. catches in the FCZ, U.S. catches would show a steady rise in recent years; 522,000 metric tons (1,151 million pounds) in 1976, 560,000 tons (1,235 million pounds) in 1977, 611,000 tons (1,347 million pounds) in 1978, and 629,000 tons (1,387 million pounds) in 1979.

Marine recreational catch

The most recent data available are for 1970. In that year U.S. marine recreational fishermen caught an estimated 1.6 billion pounds of marine (saltwater) finfish, or about the same as the average amount of edible finfish landed by commercial fishermen in recent years.

World landings

In 1978, the most recent year for which data are available, world commercial fishery landings were a record 72.4 million metric tons, almost 2 percent more than the revised 1977 total of 71.2 million metric tons. Japan was the leading nation with 15 percent of the total; the USSR, second with 12 percent; China, third with 6 percent; and the United States, fourth with 5 percent.

Prices

In 1979, U.S. exvessel prices (prices received by fishermen and vessel owners) rose for most species. The index (1967=100) for edible fish and shellfish reached 453.3 in 1979, up 14 percent compared with 1978. Among the few exceptions to this trend were prices for flounders, pink salmon, hard blue crabs, and American lobsters, all of which declined slightly. The index for industrial fish was 309.3 in 1979, 5 percent above 1978.

Processed products

The 1979 value of domestic production of edible and inedible processed fishery products was $4.7 billion, 5 percent above 1978. The value of edible products increased to $4.3 billion, 6 percent above 1978. All categories of edible products increased in value except canned fishery products. The value of industrial products of $415 million in 1979 was about the same as in 1978.

Foreign trade

U.S. imports of edible fishery products were 2.4 billion pounds (product weight) valued at a record $2.7 billion in 1979, down 2 percent in quantity, but up 18 percent in value. U.S. imports of nonedible (industrial) products were $1.1 billion in 1979, 39 percent above 1978.

The United States exported a record 553.6 million pounds valued at $1.0 billion of edible fishery products in 1979, up 23 percent in both quantity and value from 1978. Exports in 1979 of nonedible products were $62.2 million, 16 percent below 1978.

Supply

The U.S. supply of edible fishery products (domestic landings plus imports, round weight equivalent) was a record 8.3 billion pounds in 1979, 1 percent above 1978. The increase was caused by record U.S. landings and near-record imports of edible products. The supply of industrial fishery products was 3.6 billion pounds in 1979, 6 percent above 1978. Record domestic landings of industrial products and increased industrial imports were responsible for gain.

Per capita consumption

U.S. consumption of fishery products was 13.3 pounds of edible meat per person in 1979, down from the record 13.6 pounds in 1978.

Appendix V Marine Fisheries Advisory Committee

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